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ABSTRACT

The papers in this book describe significant population research done by psychologists from 1972 to 1975. It is hoped that the papers will stimulate more psychologists to become involved in population research and inspire those now in the field. The book begins with an overview of the development of population psychology. The remainder of the book is divided into three parts. Part I deals with research issues and needs in population psychology. Topics discussed include demographic evaluation systems, psychological consequences of population change, family formation and marital relationships in population research, and personal communication and population research. Methodological and theoretical issues are treated in Part II. Discussed are methods used in forecasting family planning behavior; multiple-regression and facet techniques used in population research; test-retest reliability; preliminary findings in birth planning values and decisions; social and psychological determinants of fertility intentions; values and demographic conditions in attitudes on population policy; psychological determinants of nuptiality; and fertility choice behavior. The book ends with a brief look at educational issues in Part III, discussing the development of psychologists for work in the population field. (Author/RM)

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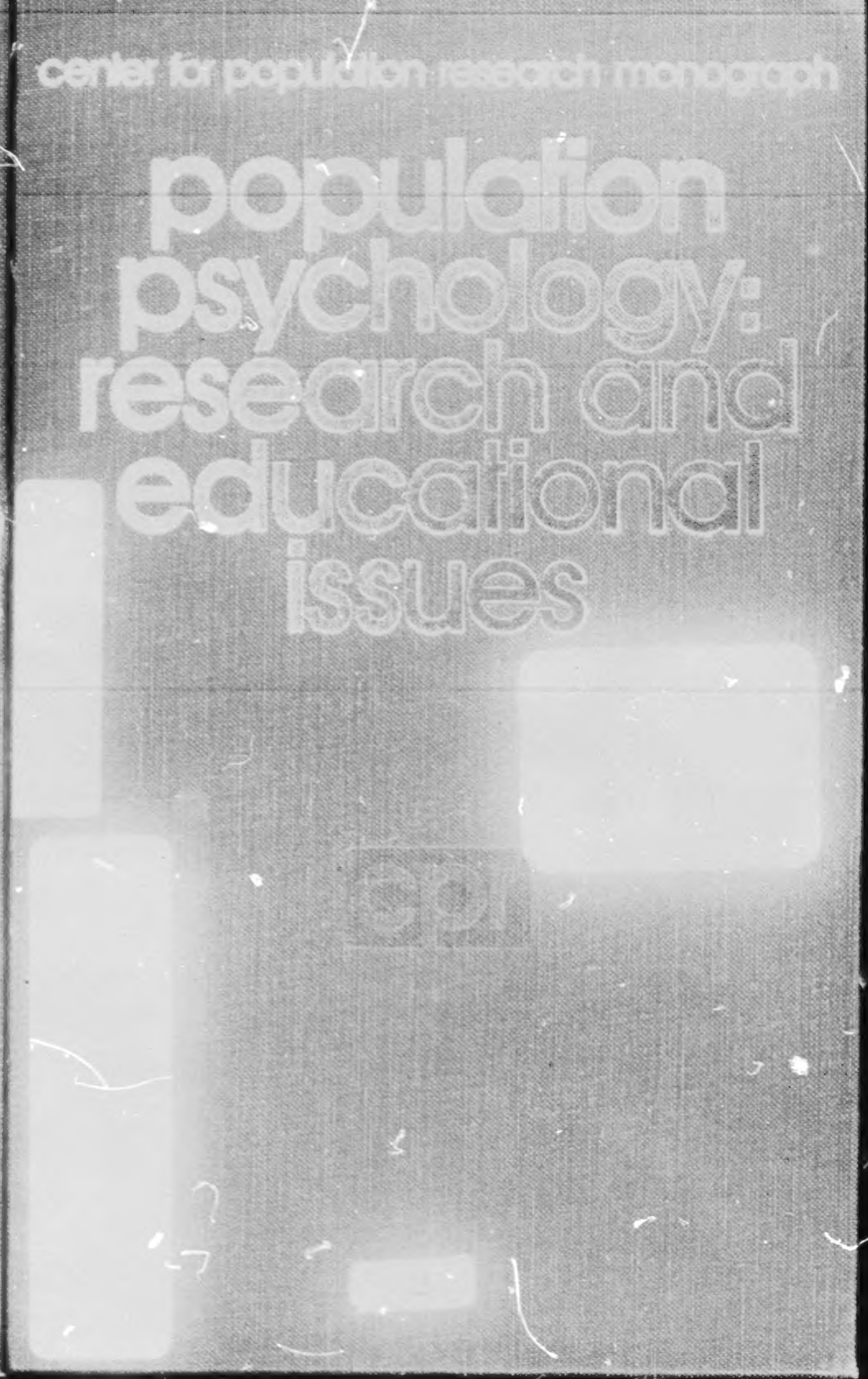

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POPULATION PSYCHOLOGY: RESEARCH AND EDUCATIONAL ISSUES

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Preface

The Center for Population Research has a deep and continuing interest in encouraging population research by psychologists and in educating pyschologists in population.

This book delineates population psychology in the process of development from very small beginnings in 1969–70. It demonstrates how psychologists have developed interests in population because of its great importance to the United States and all the other countries in the world, as well as because of the relevance of population to psychology and vice versa. With a high degree of motivation and indeed, in some instances, dedication, psychologists are using their backgrounds, theories, and methodologies to study significant population issues and problems. The papers in this book represent pioneering efforts from 1972 to 1975. While not covering all the kinds of population research being done by psychologists, they do present an excellent picture of the range, scope, and diversity of the significant work being done. Perhaps more importantly, these papers highlight the important contributions that psychologists can make in the field of population, both within their discipline and as participants in interdisciplinary research.

It is hoped that the articles in this book will stimulate more psychologists to become involved in population research and inspire those now in the field to still greater efforts.

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Chapter 1

Population Psychology in the Process of Development: An Overview

VAIDA D. THOMPSON AND SIDNEY H. NEWMAN

Population psychology is at a relatively early stage of development. This point may be emphasized by a quotation from the report of the American Psychological Association (APA) Task Force on Psychology, Family Planning, and Population Policy: "When the Task Force held its organizational meeting on December 17, 1969, fewer than a dozen of this nation's more than 31,000 psychologists were estimated to be working primarily on population-related endeavors."[1] Since 1969, population psychology has made remarkable progress, with the establishment in 1973 of a Division of Population Psychology in the APA, considerable increase in attention to and research in the population field, and growing activity at national and regional meetings of psychologists.

This book should be considered in the context of the development of population psychology. Thus, while reflecting the level of this development, its contents also represent the thinking and activities of psychologists in the forefront of population research and teaching. The general emphases are on population psychology research issues and needs (part I), methodological and theoretical issues that are pertinent to both research and teaching (part II) and development of educational programs in population psychology (part III).

Psychologists are very much needed in population research and teaching, and it is hoped that the papers presented in this book will arouse and maintain psychologists' interest and activity in population. The various papers point to a considerable number of population problems and areas in which psychologists can make outstanding contributions as researchers and teachers. While this demonstrated scope is broad, the possible population psychology problems, issues, and areas are by no means exhausted here.

PART I. RESEARCH ISSUES AND NEEDS

Part I presents papers from the symposium entitled "Issues for Psychologists Involved in Population Research," held at the 1972 APA annual convention and chaired by Vaida Thompson.[a] This symposium contained so much of worthwhile and lasting interest that it is presented in this book. The symposium brought together four experts in population (Palmore, Fawcett, Back, and Flapan) with different backgrounds, expertise, and interests. These panelists presented papers that delineated major issues of psychological research on population problems and discussed approaches to these issues. In order to achieve perspective on population research, the panelists were asked to speculate on the probable nature of this research 5 years hence. To give immediacy to their thinking, however, the panelists were also asked to focus on current problems and to suggest means of achieving comprehensive and maximally beneficial results. The resulting papers offer stimulating research challenges to psychologists and other behavioral-social scientists.

The first paper, by Palmore, a sociologist-demographer who has given considerable conceptual and research attention to the need for psychological input to population study, offers a challenge to psychologists and other behavioral scientists who do not yet fully appreciate psychological research on population problems. It suggests to nonpsychologists that the "failures" of psychologists (e.g., to find psychological determinants of fertility) have not necessarily been the result of definitive investigations, and that such studies may not really have been methodologically adequate psychological studies. For psychologists, the paper suggests that they use demographic approaches or embed research questions in demographic data collection.

Palmore provides some cogent and testable hypotheses, implicitly challenging psychologists to construct designs for testing them. He also challenges psychologists with problems of developing methodologies for research situations in which, for the most part, relatively crude quasi-experimental designs, using possibly unsatisfactory measures, are being used. Palmore further points to other research needs that might be confronted more easily: the need for the development of more reliable and valid measures, the need for better data analysis techniques, and the need for more comprehensive theories of psychosocial behavior. He concludes that psychologists could contribute new interpretations of extant data and, ultimately, could shape the development of imaginative studies of differential fertility and of more adequate family-planning programs.

The second paper, by Fawcett, offers a perspective on psychological consequences of population change. These consequences are foreseen from demographic predictions of projected densities, childlessness and one-child families, and altered spacing and timing of children. These kinds of population phenomena are seen as likely to occur with increases in female employment and day care. He then proposes psychological questions connected with each of these kinds of consequences—questions pertaining to definitions of issues, experimental gaps, and inconsistencies of research results.

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[a] Also included is a paper by Palmore that was presented at the Conference on Major Issues in World Communication, East-West Center, Honolulu, 1972.

The questions Fawcett proposes are complex, suggesting, as did Palmore, the necessity for multidisciplinary collaboration in studies that necessitate approaches other than relatively precise, but restricted, laboratory experiments. Also Fawcett stresses, as did Palmore, the necessity for using a genuine longitudinal approach, rather than the more easily accomplished retrospective or short-term prospective methods. He also suggests the need for a commitment to a psychological and a multidisciplinary resolution of the problems encountered in population.[b]

In the third paper, Back presents a penetrating discussion of the interrelatedness of psychology and demography from a historical and conceptual perspective. He is interested in the development of a genuine psychology *of* population, as differentiated from the more fragmentary approach of the use of psychology *in* population studies. Thus, it is necessary to consider the biological constraints and mechanisms that underlie population composition, distribution, and change; these have been modified by social and cultural factors and are expressed in the motivations and behaviors of the individual. Thus, a unifying aspect of population studies that can be conducted by psychologists is the transformation from biological necessities to social conditions.

Back points out that the demographer studies certain events occurring in the life cycle of each individual. These crucial events, such as schooling, vocational choice, marriage, childbearing, and social and spatial mobility, are the result of a series of decisions. The study of the interactions among the various behaviors and the decisionmaking processes constitutes a psychological approach to population problems and demography. As Back says, "Given the theories and concepts of the psychologists, how can they describe and predict the demographic events in a person's life, their sequence, and interaction? This work would help unify ideas in both psychology and demography."

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[b] Such a suggestion reflects current pervasive issues in psychology. In Anastasi's presidential address at the 1972 APA convention, she noted: "Psychologists are—and should be—increasingly concerned with the solution of society's problems." She urges that psychology's contributions be regarded "against . . . a multidisciplinary perspective" to which the psychologist can contribute toward "an effective, long-range solution of social problems" by developing a "psychotechnology" which, she points out, "is needed to provide mediating links between basic social research and the solution of practical social problems."[2]

Back also points to the methodological considerations flowing from his conceptual framework. In essential agreement with Fawcett, Back points to the necessity of progressing from the restricted but precise work on individuals or small groups in a laboratory situation to studying complex lifespan phenomena of the individual in the context of the societal environment in which he lives.

While Back and Flapan independently developed the conceptual framework of their respective approaches to population research, Flapan's concepts, presented in the fourth article of part I, are specific deductions that would flow from Back's more general theory. Thus, Flapan is interested in studying the behavioral-decisional areas of family-formation processes and marital interactions at stipulated points in the lifespan. He proposes short-term longitudinal studies of the decisionmaking and motivational processes of couples considering childbearing at various successive stages of their marital lives. Such stages might include the initial stages in the family-formation process before the birth of the first child, the stages before each successive child, and the final stages of family formation.

Methodologically, Flapan emphasizes the study of the marital dyad in the family-formation process. This is a relatively new approach, since most studies have focused on the wife, while some have studied the wife and husband separately. Such an approach requires the development of methods in which wives and husbands would discuss their childbearing plans and motivations and attempt to arrive at decisions concerning childbearing. Flapan discusses several promising methods, such as role playing, "revealed difference technique," and "delayed marital dialog."

Flapan furnishes a systematic framework for studying the family-formation process and suggests ingenious methodological approaches for conducting the studies. These kinds of investigations have great potential for generating psychological theory and research, which will increase the depth of understanding of childbearing motivations, decisions, and behavior.

In a second paper, presented to the panel on "Research in Population Communication" of the Conference on Major Issues in World Communication (1972), Palmore also developed many research issues that would interest and challenge psychologists. Although speaking with a light touch, Palmore is very serious about the kinds of population communication research problems he selects for investigation. As he says, "Our research should be directed to understanding the how, what, when, where, and why of true population communication. The mass media or other devices we use should be seen as simply one input into an ongoing everyday population communication process." The main point he emphasizes is "people are not targets; they are population communicators."

Many critical research issues arise out of Palmore's conceptual views, and he selects 10 to list. All of these research questions are of interest to psychologists. Some of those with perhaps the highest specific interest are the following:

- In what ways do results of experiments in social psychology fit with population communication research?
- What interpersonal communication factors affect the long-term selective perception and retention of population messages carried by mass media?
- How does population density affect the efficiency and types of interpersonal communication that occur?

PART II. METHODOLOGICAL AND THEORETICAL ISSUES

Theory and methodology may be considered as research issues, since they are essential to research. In the emerging area of population psychology, however, theory and methodology are in the process of development and in need of special attention. This section, therefore, has the purpose of bringing some selected important methodological and theoretical issues to the attention of psychologists and other behavioral-social scientists. There are, of course, many other such issues that are not discussed here, but to which, it is hop[illegible], attention might be given elsewhere.

In the first article, Gough has used his special psychological expertise to develop exploratory innovative approaches to the search for psychological factors involved in, or predictive of, fertility regulation. He carefully selected psychological measuring instruments with demonstrated relevance to family planning or fertility regulation and target variables measuring the following aspects of fertility regulation: number of children wanted, women's preference for the pill or intrauterine device, and men's choice of vasectomy. As Gough points out, "Each of these target variables has a more or less self-evident importance, and none appears to have yielded so far to a predictive methodology." Gough proceeded to use four methods of relating the personality and attitude measures to the target variables: regression equation, decision tree, typological classification, and conjoint analysis. When possible, he also illuminated discovered relationships with analysis of the patterns of the psychological measures that might account for their predictive power.

Gough states, "The results obtained in these analyses suggest that the regression equation is a difficult method to surpass." (In another article in this section, Ager also demonstrates the usefulness of multiple regression analysis in family-planning research.) However, the decision tree, the typology, and the conjoint analyses all demonstrated that they have promising places in the analytic methodologies of population researchers, with the reservation that these exploratory approaches need cross-validation studies. Furthermore, as Gough points out, these quantitative analyses did not merely yield numerical findings, but "were rich in interpretive implications, and permitted the setting forth of a large number of hypotheses that investigators preferring other modes of study might find worthy of consideration." Gough's article is innovative, pertinent, and stimulating, which makes it important and useful to researchers and teachers in the population field.

The four papers that follow Gough's (by Ager; McClelland, Coombs, and Coombs; Townes, Campbell, Beach, and Martin; and Davidson and Jaccard) demonstrate some of the methodological and conceptual advances that have occurred in the very brief span of time, 1972–74. The papers were given at a symposium entitled "Theoretical and Methodological Approaches to the Study of Population Issues" held at the 1974 APA annual convention. Although this symposium was chaired by Thompson, who also chaired the 1972 symposium, it was not intended as a sequel to the earlier panel. Nevertheless, in many ways there is a strong complementarity to the earlier papers. The earlier set emphasized demographic, survey, field, and longitudinal approaches but strongly urged, within these approaches, greater attention to individual and dyadic decisions in relation to population behaviors. The more recent set explicates what might be considered to be essentially microlevel processes, focusing on individual and dyadic decisionmaking. While survey methods and field studies are used and longitudinal studies are proposed in the latter set, there is an even more explicit application of psychological theory and research methods. The more recent set might appear to demonstrate a greater sophistication in methodology and theory; instead, they no doubt demonstrate recent refinements in psychological models and techniques that may aid in achieving the research goals envisioned by the earlier group.

Ager's paper is perhaps more aligned with the methodologies envisioned by Palmore in his 1972 APA presentation. Ager reports the administration of attitude questionnaires, carefully derived by means of facet analyses, to a large sample of respondents and the analysis of the data by multivariate techniques. There is thus an attempt to deal with two frequently cited problems with survey data: that the items used do not reflect complex attitude structures of respondents, but provide only superficial, often poorly interrelated, responses, and that the complex interrelatedness of responses suggests multivariate processes that cannot be revealed in, for example, marginal means in twofold tables.

In addition to the item derivation and analytical techniques used, Ager's work also demonstrates possible focuses of psychologists that are common to researchers from other disciplines, in particular, the perceptions of professionals involved in family-planning services and in providing care to abortion patients. Such perceptions of medical personnel obviously must be factors in the successful implementation of new procedures in these areas, but they are often overlooked or poorly understood in consideration of the introduction of new contraceptive and abortion services.

Aside from the methodological and statistical benefits that psychologists and members of other disciplines might derive from the Ager article, some of the findings are also suggestive of the need for multidisciplinary research. For example, background factors (as religious affiliation), often ignored by psychologists, were strongly predictive of attitudes toward family planning; collaboration with skilled demographers might aid in more thorough understanding of the types of demographic variables that might also be considered in relation to such issues. However, on the issue of contraceptive continuers and dropouts, the results suggest that psychological variables as well as demographic variables are important predictors, which would suggest that psychological input into demographic studies would also provide mutual benefits.

The McClelland, Coombs, and Coombs paper should be recognized as presenting a further refinement of techniques developed by Coombs.[3] While not cited by the authors, the article should provide psychologists as well as demographers with a companion piece to the much cited Goldberg and Coombs[4] article on norms of family size, in which some provocative conceptualizations relating to family-size decisions and norms are presented. The two family-size and sex-composition preference models tested in the McClelland et al. research should provide useful insights to microeconomists who are incorporating economic models derived from Easterlin,[5,6] Leibenstein,[7] and others in their research.

Several aspects of the McClelland et al. study might trouble population researchers. First, the study could be classed principally as a methodological one, and thus be seen as providing more sophistication of technique than understanding of the processes involved; such criticisms are often leveled at psychological research, but the provision of more adequate techniques of measurement should be a compelling argument against such a criticism. Second, the use of college students, obviously not yet in the relevant dyadic decisionmaking situation, has also been criticized by population researchers. Although these researchers incorporate a sample of Taiwanese women, who may be more appropriate subjects, the tremendous differences between the two samples perhaps raise more questions about the generalizability from college student and American samples to other populations. Both problems diminish in importance if the methodological development aspect is enunciated. Quite clearly, however, as the authors note, problems in prediction of actual fertility behavior remain, and, as they suggest, longitudinal studies must be done. Presumably, the techniques could also lead to assessment of cross-cultural differences in family-size desires as predictors of subsequent behavior, as well as of cross-cultural differences in spacing and composition preferences prior to reproduction and as affected by reproductive experience.

Both the Townes, Campbell, Beach, and Martin, and the Davidson and Jaccard papers focus on factors that may affect family-planning decisions and behavior; both papers incorporate a plan for longitudinal assessment of actual behaviors, and both use sophisticated methodologies directed toward tests of psychological theories. Perhaps a major difference between the Townes et al. and the Davidson and Jaccard research is that the former focuses on the decisionmaking couple and the latter only on females. While either is defensible in psychological research on such issues, there has emerged a strong preference for the couple focus. One can, of course, argue that the Fishbein model used by Davidson and Jaccard at least implicitly incorporates the influence of the partner in the normative belief/motivation-to-comply component and that the Townes et al. attempt to study the couple decision process by individual partner assessments precludes evaluations of influences that could be detected using the kinds of couple interaction techniques Flapan has proposed. In fact, both the Fishbein behavioral-intent model and the decision-theory model (upon which the Townes et al. research is based) might be questioned by those who would maintain that verbal responses may not mediate other behaviors. However, both investigators do plan later studies involving actual behaviors.

Like the McClelland et al. study, it should also be noted that both the Townes et al. and the Davidson and Jaccard studies provide concepts and methods that could be usefully incorporated in demographic and microeconomic studies of fertility decisions. At the same time, however, the fairly restricted subject samples in both studies might well be of concern to those demographers and psychologists (as Ager) who maintain that background (i.e., demographic) factors may be more crucial predictors of behaviors than are psychological, particularly attitudinal, factors. Quite clearly, both sets of researchers intentionally selected samples that made it easier to control for as many nonpsychological factors as possible. While there may be problems of generalization, the findings from both studies should provide insights about processes and lead to designs of research with broader and more representative samples.

The Davidson and Jaccard study would suggest, as has other psychological research on attitudes toward population issues (cf. Thompson and Appelbaum[8]), that psychological characteristics, and thus psychological models, should indeed be incorporated in demographic survey studies of predictors of population behaviors. The kinds of psychological variables to be assessed are also underscored in the findings that subjects who plan to have a child within the next 2 years and those who do not both focus on the consequences of either decision, but that the two groups have different beliefs about the probability that the behavior would lead to consequences and different perceptions of the desires of significant referents (as husband and doctor). Such microprocesses are often ignored or poorly assessed in studies on such issues.

The Townes et al. research, in which an even more restricted sample was used, provides strong evidence that subjective probabilities and utilities can be reliably measured and used to predict decisions if instrument development is carefully undertaken. A reading of the articles cited 9–11 should suggest that the processes of concern are, in fact, reliable predictors across studies using quite different models and instruments.

Quite clearly, in the Townes et al. research, the findings on couple similarity should offer some justification for measuring wives' attitudes only, although the influence processes were not assessed. In addition, the report of significant differences in utilities (or motivations for parenthood) across parities provides necessary insights and guidelines for research on such issues; it also suggests the problems inherent in attempting to generalize from plans of nonmarried or never-parented subjects to those who have experienced parenthood. Such findings also justify the researchers' intentions to study couples at higher parities than were studied and to collect longitudinal data on the couples already studied. The assessment of the usefulness of such findings in counseling is also worth pursuing.

The final papers included in part II, separately contributed (as was Gough's), largely pertain to field or cross-cultural studies concerned with methodological and theoretical issues.

Brackbill's paper is concerned with the reliability of measuring instruments, a problem that psychologists have been working on for a long time and one which Palmore discussed in his APA symposium paper. However, as Brackbill indicates, "The widespread use of the questionnaire and interview as measuring instruments in population research has been, for the most part, unaccompanied by evaluation of their reliability." Her study focuses on test-retest reliability of a questionnaire administered to teenagers concerning family formation and population growth. The findings indicate that reliability was affected by the content of the items, the psychological attributes represented in the items (knowledge, attitudes, and desires), and certain characteristics of the respondents (age, race, and religion). Thus, this paper underlines the necessity not only for determining the reliability of measuring instruments, such as questionnaires and interviews used in population research, but also of refining the analysis of reliability to take account of factors such as those investigated by Brackbill. It may be added that there is also a need for analytical studies of the validity of measuring instruments used in population research.

Back's paper, parts of which he presented at meetings of the International Union for the Scientific Study of Population (1973) and the World Association of Public Opinion Research (1973), is concerned with factors involved in population policy. This paper is important for its conceptual and methodological developments in an area that has received little attention from psychologists and other behavioral-social scientists. Back is interested in developing a theory of conditions and factors pertinent to the development of population policies in a variety of countries. He approaches this through an analysis of secondary data derived from two sets of surveys. Such an analysis, unusual for psychologists, presents technical and conceptual difficulties that Back was able to overcome. The analysis resulted in four sets of survey items that could be used as independent variables for the differential prediction of two dependent variables: concern with population growth and acceptability of birth control. In order to investigate the pattern of relationships of these variables within the context of the developmental socioeconomic status of the countries, Back classified the countries by means of cluster analysis, using a conceptual framework and methodological approach evolved by him and his colleagues. He also developed some designs to investigate the interacting patterns of relationship among the independent variables, the dependent variables, and the contextual country variables.

Thus, Back has investigated some aspects of the highly complex problems of population policy in many countries, with innovative and ingenious conceptual and methodological approaches. The quantification and analysis of the data should stimulate other behavioral scientists to further efforts along similar lines. As Back says in conclusion,

> We have sketched here the first step in the technique to make it possible to control a wealth of data from many countries and to include many relationships to the variables in which we are interested. This would make it possible to use secondary analysis for establishing general social theories, testable over a range of societies, to avoid many dangers such as ecological fallacy, and to prevent the researchers' being swamped in a wealth of data.

Population psychology greatly needs theoretical and conceptual frameworks to give focus and meaning to research, to facilitate the synthesizing, ordering, relating, and interpreting of findings, and to point the way logically and systematically to new research ideas and approaches. The insufficiency of present theory probably reflects, to some extent, the relatively early level of the development of population psychology.

The papers by Fawcett and by Friedman, Johnson, and David are excellent examples of the building of psychological theory in the population field. Both Fawcett and David and his colleagues were very early contributors to the population field and have had a few years' time to reflect on the kinds of theories that might be needed to advance the field.

In an article presented at the International Population Conference of the International Union for the Study of Population (1973), Fawcett presents a social-psychological theoretical framework, or conceptual schema, to further the understanding and study of psychological determinants of nuptiality. It is suggested that this schema might contribute to the development of psychological research on marriage, especially with regard to motivations for and alternatives to marriage and the linking of marriage and fertility. Fawcett makes considerable use of the psychological theory of fertility, particularly with regard to the value of children, developed by Hoffman and Hoffman[12] and Hoffman and Wyatt.[13]

Fawcett's theory is concerned mainly with the making of decisions on whether to marry, when to marry, and whom to marry, with the major consideration being "whether." It is meant for possible cross-cultural and comparative research. The conceptual scheme is presented diagrammatically and explained in some detail. The purpose of the conceptual scheme is to stimulate thinking concerning possible research on the psychological determinants of marriage. In this connection, Fawcett points to the topic "Perceived Benefits and Costs of Marriage and Alternatives" as a priority area for psychological research.

Friedman, Johnson, and David present what is probably the most comprehensive psychological theory of the dynamics of fertility choice behavior extant today. The theory is meant to serve as a base for generating research and integrating research developments. The authors summarize the substance of the paper and their point of view so clearly in their own summary that the major portion of it is presented here in lieu of further discussion:

> It is the broad contention of this chapter that there is an urgent need for psychologists to pursue research leading to a clearer understanding of the dynamics of fertility choice behavior. There are three main reasons for this: fertility choice behavior is (1) the major causal factor of the population crisis, (2) modifiable, and (3) a proper and important subject matter for psychologists as scientists of human behavior.
>
> This paper makes recommendations in regard to how populations for study

> might be defined, the timing of research in relation to the short- and long-term stages of the fertility career, the nature of data that need to be collected, and the methodological factors in the design of research. In brief, we recommend that the couple be the primary unit of research, that populations for study be defined on the biopsychosocial dimension of stage of the fertility career, and that the data to be collected fall into the following five categories of variables: (1) certain environmental factors as objectively measured, (2) some of those same factors as perceived by the respondents, (3) some individual characteristics focused primarily on the individual's state of mind in regard to specific fertility decisions (including (a) the awareness of alternatives, (b) the psychosocial costs assigned to them, (c) the belief about likelihoods of certain alternatives leading to certain outcomes, (d) the identification of those outcomes, and (e) the values placed on them; the nature of those data is to be taken in the framework of a chain of eventual new states, and the major concerns in that regard are with the presence of planning for success or failure of behavioral choices), (4) the concordance between partners and the accuracy of their mutual perception, and (5) certain characteristics of the couple that relate to communication, division of responsibilities, locus of authority, and satisfaction together.
>
> We suggest that such data can be derived independently from each partner, or minimally from one, including data about the partner's beliefs, and that it is not essential (although certainly desirable) to observe couple interaction in vivo. The more precise defining of the populations for study reduces the very large number of variables that would otherwise need to be considered, and the research consequently becomes both easier to manage and more sure of conclusive interpretation.
>
> The possibility of defining populations for study on the basis of self-selecting biopsychosocial dimensions makes cross-cultural comparisons more meaningful, and we urge that they be made because of the tremendous gain to be derived from the natural experiment of diverse conditions throughout the world, when the urgency of useful findings is so great. . . . We urge, therefore, the development of additional transnational prospective studies of fertility choice behavior at different stages in the fertility career and in interaction with different kinds of service and information providers, and that whenever possible, they be done on a prospective basis so that behavioral tests of the validity of hypotheses become possible.
>
> Finally, as behavioral scientists, we wish to emphasize that the study of fertility dynamics is of profound importance for theoretical as well as practical reasons and that the science of psychology has much to gain from its pursuit. [Pp. 195–197.]

PART III. EDUCATIONAL ISSUES

Educational programs are necessary to the development of psychological researchers in the population area. There are a few psychologists who are teaching population or family-planning courses. In some universities, psychology departments or individual psychologists are participating in interdisciplinary programs in population, or psychology students are working on master's or doctoral theses on population topics. However, there appears to be a complete absence of integrated psychology and population curricula in which a student might major or minor in population psychology on either the graduate or the undergraduate level[1, 14]

Part III presents the report of a workshop entitled "Developing and Educating Psychologists for Work in the Population Field." In organizing this workshop, it was recognized that a broadening of psychological research on population issues might not emerge and surely will not endure if such issues are not made a part of the education of psychology students. Throughout their education, students need to be made aware that the multidisciplinary focus on all population issues—from migration through urbanization and fertility-regulating behavior to the changing roles of women and men in evolving societies—necessitates psychological considerations. As psychologists become familiar with the issues, they need to become more attuned to the basic behavioral phenomena that, while of considerable social, economic, and political significance, need to and *can* be observed and studied by psychological laboratory, clinical, and field research methods. Further, psychologists need to know that until they can effectively deal with such problems, significant gaps will be present in psychological theory. For example, if psychologists cannot contribute to a better understanding of why people want children, migrate, etc., they cannot claim broad expertise in the understanding of dynamics of human behavior. They must be educated, theoretically and methodologically, to deal with such issues as the individual's and the group's role(s) in such population phenomena as sex behaviors, reproductive behaviors, fertility regulation, migration, family formation and structure, policy development, and population education.

The workshop reviewed in part III was chaired by W. Grant Dahlstrom and consisted of 21 members from 17 organizations, including 13 universities, the APA, the Cleveland Clinic, the Center for Population Research, and the Transnational Family Research Institute. Participants were selected to include chairpersons of departments with possible interests in population and departmental members interested in population. Representation of major psychological areas such as social, clinical, developmental-child, experimental, physiological, and quantitative was also accomplished. The workshop, then, was composed of a group of interested and knowledgeable psychologists from a number of important areas of psychology. The workshop report should serve to stimulate the development of educational programs in population psychology as well as to encourage psychologists who are turning to a consideration of societal problems, with special reference to population problems.

The workshop report further underscores the need for psychologists interested in population to be well educated concerning demographic techniques and research findings. Although geared more toward ways in which individuals or groups of psychologists might move toward developing courses, curricula, or educational programs in population psychology, the workshop report also includes questions that, while they may be of diverse concern to specialists within psychology, have been evolved from multidisciplinary research and require continued multidisciplinary attention. Despite their multidisciplinary nature, questions and issues cited for study by psychologists are those that fit within the goals of psychologists of various orientations and that can be studied profitably within the various areas of psychology. Several beneficial outcomes of enhanced research and education in population psychology are likely to emerge: psychology students will be encouraged to come to grips with some of the greatest and most enduring problems of society, greater understanding of population phenomena will emerge with psychological study, and psychological theories and techniques will be advanced through attention to crucial population issues.

GENERAL CONSIDERATIONS

All of these papers on research and education contain a challenge for psychologists of diverse interests: developmental psychologists are challenged to look at socialization processes; clinical psychologists are offered a wide range of individual, dyadic, and family processes to investigate; social psychologists are urged to examine the need for field and laboratory research on multiple attitudinal-behavioral and communication issues; experimental psychologists with physiological interests are directed to the biological-psychological need and drive frameworks; experimental psychologists with a learning orientation are urged to assess the effects of experimental manipulations on changes in behaviors; quantitative psychologists are asked to search for means to adapt their techniques and develop more adequate measurements; and psychologists of educational or counseling orientation are asked to apply their expertise to teaching or family-planning programs.

The breadth of the papers presented suggests the enormity of the problem and the diversity of contributions psychologists—and perhaps only psychologists—can make. Not only may contributions be unique to psychology, but they may also represent unique individual contributions. Ultimately, however, as all the papers presented in this book suggest, interrelated research of diverse disciplines will be required to provide definitive answers to the multiple questions posed. Psychology must be involved in the study of population. Until psychologists recognize that population phenomena are legitimate and enduring concerns, and that they must develop research and educational programs in population psychology, no lasting benefit to population or to psychology is likely to emerge.

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PART I

Research Issues and Needs

Chapter 2

Demographic Evaluation Systems and Psychological Research Designs[a]

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Most demographers become queasy when asked for any projection. After all, we have not been notably successful with population projections; the population titles of an earlier era included *The Twilight of Parenthood*[4] instead of today's *The Population Bomb*.[5] Now I find my demographer self faced with Dr. Thompson's question:[b]

> If one could project to a time 5 years hence, what might one hope that psychologists would have considered and resolved relative to population?

Already a bit uncomfortable, my feelings as a demographer are aggravated further because some demographers (e.g., Hauser and Duncan[6]) have argued rather forcefully against psychological reductionism in fertility and family-planning studies. The argument has been strengthened by several well-known "failures" to demonstrate that psychological variables are strongly related to fertility and family-planning behavior—the Princeton studies and the earlier Indianapolis study are two important cases (for a review of pertinent aspects of these and other studies, see Fawcett's 1970 monograph[7]).

No matter how uneasy I am, however, I must respond. Projections are useful, if somewhat shaky. Further, while scholars may be lured easily into impassioned discussions of psychological reductionism as compared with sociological expansionism or economic determinism, the merits of such debates are questionable. Clearly, many different conceptualizations and approaches to population data are needed and worthwhile.

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[a] This paper is a revision of a presentation given at the symposium entitled "Issues for Psychologists Involved in Population Research" held at the annual meeting of the American Psychological Association, Honolulu, Hawaii, Sept. 1972. Some of the remarks have been presented elsewhere, notably in the work of Palmore and Chung[1] and Palmore.[2] There are also many common elements between these remarks and a discussion by Freedman.[3]

[b] Each member of the symposium panel was asked to respond to this same question.

Ultimately, it is one person (a "psychological" being) who acts to avoid or terminate a pregnancy, to migrate, or to die, but he or she takes this action in a certain social and economic environment. Sociologists, economists, psychologists, and medical personnel, we hope, all can accept that simple statement; then the question becomes more researchable. What variables from each academic system are useful in explaining behavior? What variables will provide the most guidance to social policy formulation?

There are many reasons why psychological variables have not been found highly explanatory in early studies. One reason is only a matter of definition; the "successful" variables were not defined as psychological when in fact they are very much psychological. The question "Do you want any more children?" and related questions dealing with fertility expectations have been highly useful (see, e.g., Davidson[8] and Freedman and Bumpass[9]). The unwanted-child notion has been very prominent indeed in family-planning movements all over the world. Perceptions of the attitudes of others also have been shown to be important in family-planning acceptance,[10] and the attitudes of elites in every country affect laws about induced abortion, the sale of contraceptives, and many similar matters. Knowledge of contraceptives and how to use them is also an individual, psychological phenomenon. Many additional and important examples can be found in the demographic literature.

Other possible reasons for former failures of psychological studies include (1) the use of homogeneous samples, (2) the measurement of an inappropriately selected set of psychological variables, (3) inadequate measurement, (4) inappropriate data analysis, or (5) psychological variables that really are not highly explanatory.

I believe that we will see fewer and fewer so-called failures in the coming years, particularly if we learn from past experiences. I believe we may achieve maximum benefit by (1) adhering to certain data-collection strategies, (2) pursuing research questions where the talents of psychologists are most necessary, and (3) using those analytic techniques most suitable for demonstrating the effects of psychological variables.

DATA-COLLECTION STRATEGIES

Let me begin by discussing how psychologists might go about collecting data on population questions in the next 5 or 10 years, rather than what questions should be answered. As immediate strategy, my central thesis is that most psychological research should be integrated into routine demographic data-collection procedures.

Demographic evaluation systems usually consist of several different data-collection devices: censuses, vital registration systems, and sample surveys of various kinds. Since so many demographers and others currently are concerned with fertility and the population explosion, we should mention explicitly sample surveys of the knowledge, attitudes, and practices of women or men on family planning, service statistics, followup surveys of family-planning acceptors, and special fertility surveys or abortion surveys of various types.

Since a great deal of money, time, and effort is being spent on family-planning programs in many countries, how do we evaluate that expenditure and the success of those programs? What is happening outside the formal family-planning program, and how do we evaluate the effects of nonprogram factors on fertility?

I suggest as a strategy for the immediate future that psychologists integrate their measures into these conventional, routine demographic measurement devices. The implications of this strategy are many, but two should be stressed. First, short packages of psychological measures need to be developed for inclusion in surveys or service statistics systems that already have many questions that must be asked. As an alternative to this strategy, of course, subsamples of bigger studies can be taken and given measuring devices that take longer to administer. The short-package strategy, however, is probably preferable. Second, high-impact psychological variables need to be identified quickly. Administrators and others responsible for taking the routine demographic measures are not going to be impressed with measures that are not highly correlated with either fertility or family-planning use. Hence, the psychological measures must be shown to have an effect early in the research process, or the administrators are very likely to decide to omit further consideration of psychological variables. As a corollary to this second point, I suggest that psychologists be concerned with trying to determine psychological factors that directly affect fertility or family-planning *behavior* and not just some other attitude; that is, they should predict behavior and not attitudes.

The advantages of the strategy I suggest are many, but let me again stress only two. By integrating their research into ongoing evaluation systems, psychologists will be able to state results that can be compared with results from other academic approaches and that can be cumulative in the sense of building on what other disciplines already have had to say about population matters. (After all, psychologists will get no special credit for rediscovering the wheel.) Also an advantage of this strategy is that psychologists almost automatically will be obtaining good samples of important populations. To date, too much psychological research in the population area, it seems to me, has been collected on poor samples of unimportant populations.

There are many disadvantages to this procedure. One is that there are often no baseline data for psychological measures, and such data cannot be fully obtained through these demographic evaluation systems, because they require more work than can be done on a short subsection of someone else's questionnaire. The second and obvious disadvantage is that the psychologist must concentrate on relatively few variables and relatively short measurement of these variables.

An additional data-collection issue of some importance is the question of whether we should collect retrospective or prospective data. Many previous psychological studies (and sociological and economic studies too, for that matter) have been difficult to interpret because the data were taken in one cross-section survey. As an illustration of this difficulty, take the case of a study of family-limitation practices, attitudes, and perceptions. It is likely that a woman's or a man's fertility and family-limitation practices affect attitudes and perceptions as much as attitudes and perceptions affect the family-limitation practices. Since only one time point is used in cross-section data collection, it is difficult to separate cause and effect or the time sequence. Perhaps future studies should make more extensive use of prospective and panel study designs instead of the retrospective and cross-sectional type of design in more common use today.

Let me give one example of a possible strategy in the area of family-planning behavior. Collect certain psychological measures for women when they first adopt contraception at a family-planning clinic. Later, through a contraceptive acceptors followup survey, we can evaluate their practices in the intervening period between first acceptance and followup. Owing to our design, we are able to evaluate the psychological variables before, say, discontinuing contraceptive use. Hence, we can evaluate whether the prior psychological profiles differ for women who discontinue and women who continue.[c]

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[c] Looking far into the future, we have hopes that many practical uses may be found for psychological measurements in family-planning programs. One notion is that a "psychological contraindication scale" could be developed for each family-planning method. Much as medical symptoms (varicose veins or pelvic inflammatory disease, e.g.) are taken as contraindications for the pill or IUD, one can imagine the day when a score of 6 on the "pill scale" may lead a family-planning worker to advise a client to use some other method.

RESEARCH QUESTIONS

As for the questions themselves, it seems there are many important issues to which psychologists can make contributions, and perhaps more meaningful contributions than can scholars from other disciplines. One can easily pose research problems, so bear with me if I list more than we can hope to answer. I have listed 11 problems[d] on which I think psychologists can make major contributions:

1. We need to know more about the interaction of man and wife couples as this factor relates to reproduction.
2. Social distance to information and distribution points for reproductive information is undoubtedly as important as geographic distance. We need further study of what aspects of social distance are related to what aspects of reproductive behavior.
3. Old concepts need better theoretical specification and measurement; examples are ideal family size, approval of family planning, and intention to use family planning.
4. Interpersonal communication is one of the most used channels for family-planning information. What kinds of people are involved in influencing and being influenced and what factors either impede or speed this type of influence process?[e]
5. Under what psychological conditions do what types of family structure (extended versus nuclear family, number of siblings, etc.) have what effects on reproductive behavior?
6. What life-cycle and developmental-psychological changes are there in individuals that affect reproductive behavior?
7. How and when are basic population-relevant attitudes and beliefs transmitted to children or adults, and how do these change through the life cycle?
8. What motivations are relevant to reproductive behavior, and how can they be measured?
9. What are optimum communication strategies for selected reproductive information, given certain target populations? What other action-program guidelines can psychologists give us?
10. We know that education, income, religion, and similar characteristics are related to family-planning use. What are the mechanisms (psychological) that produce these relationships—that is, why do we find those relationships?
11. What are the psychological effects of crowding, migration, different size, and sex and age compositions of family? What population policy recommendations can one make on the basis of answers to questions like those in this last question?

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[d] These problems appear in an earlier paper by the author.

[e] Questions on this problem are specified more fully in ch. 6 of the present book.

There are two major limiting conditions on this set of problems, particularly if the locus of study is to be in developing countries. First, study of some of these questions will require more than just national surveys or conventional demographic data collection. In this respect, there may be difficulties in getting funding or facilitating support from governmental agencies, particularly in developing countries. (This problem is one part of my reason for suggesting we concentrate on integrating psychological research into conventional demographic data-collection systems.) Second, we lack basic baseline information on psychological measures for most populations in the developing world, since basic psychological research remains in the future for most countries.

To this early list, we can add many additional problems. There are purely methodological questions that are of some importance. The first is "acquiescence." Throughout demographic measurement systems, the question of acquiescence appears again and again in answers to questions related to family-planning use and attitudes. The reliability and validity of data on family-planning intentions, childbearing expectations, and the like is a subject for voluminous literature, and the question of acquiescence with respect to such questions has not been studied or evaluated fully.

In fact, there are many more general reliability and validity questions of some concern in demographic evaluation systems. Psychologists, perhaps more than any other group of social scientists, have developed an extensive set of tools for dealing with such questions, and they could be very helpful in this regard.

A third way in which psychologists could make major contributions is in interpreting earlier findings and, hence, leading us to new ways of thinking about previously collected data. To take one simple example, age is a very important demographic variable as related to fertility, mortality, or migration. What does age mean psychologically in relation to these processes, and how is it that psychological interpretations of age can help us determine why age does have effects on fertility, mortality, and migration? Another example lies in the definition of "modernity." The demographic literature abounds with claims that low fertility, low mortality, and modernity coexist and are causally related. What is the psychological meaning of "modernity" in this connection?

ANALYTIC TECHNIQUES

As we add more information from the perspective of yet another discipline interested in population matters, it is important that we continually think of both the cumulative nature of knowledge and the problems of comparability. Repeatedly, we need to ask, Do these new (psychological) insights add anything to the older explanations of reproductive behavior, or are they simply new phrasings for old findings? Can we compare these data cross culturally and make meaningful generalizations?

Some analysis strategies will be more productive toward this cumulative goal. In analyzing the effects of psychological variables on demographic behavior, it seems critical to analyze the data in a framework that considers the interaction of the psychological variables with each other and with the objective and subjective environment.[11] For example, modern attitudes about the family combined with a future value orientation and a perception that the social environment is favorable to small families may lead to a higher probability of contraceptive use. The interaction and combination of various psychological measures are more likely to lead to use than is any one psychological factor.

In addition, the true, "objective" environment probably interacts with psychological factors. One would expect a person to behave differently in different objective environments, even though the psychological factors are held constant.

I believe these interaction effects must be studied to evaluate fully the demographic effects of psychological variables, and the payoff from research in the next few years will be minimized if we fail to analyze data from this perspective.[f] From my own research, I have concluded that the correct approach to future research and policy planning must take account of the fact that psychological measures play different roles in different population subgroups. (From this point of view, it might be worthwhile to reanalyze the data from previous studies, for example, the Princeton studies, to see if the psychological measures have more effect in subgroups than they did in the total samples.) This approach has serious implications for information and education campaigns as well as for the network of services in family-planning programs. Future work must determine whether we can fully isolate the patterns of psychological and social environment interaction so that useful policy suggestions can be made.

One may hope that increasing knowledge about the psychological variables can be used in designing information campaigns, facilitating the distribution of methods to users, and training family-planning personnel to deal more effectively with program clients. After all, at least part of our interest in the psychological factors stems from the belief that such factors may be changed more easily than variables such as place of residence, formal educational attainment, previous fertility, and other nonpsychological variables whose demographic effects are already well documented.

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[f] One problem with this suggestion is that analysis requires large sample sizes. If psychological research is indeed integrated into the routine demographic data-collection system, however, large samples are more likely.

Information that we can use in a very practical way may be too much to expect in the next 5 years, but I believe we will certainly be closer to it in 5 years if we adopt the right strategies.

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Chapter 3

Psychological Consequences of Population Change[a]

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Before discussing psychological consequences of population change, it is necessary to specify some of the future population changes from which psychological consequences are likely to flow. That undertaking is hazardous, especially for a psychologist, since demographers long since have learned that population events can be influenced sharply by social forces that are difficult to forecast. An oft-cited failure of demographic prediction is the "baby boom" that followed World War II; a contemporary social force that is sure to have significant but unpredictable demographic impact is the rapidly rising influence of the women's liberation movement.

Nonetheless, it remains true that demographic data and methods of analysis provide an essential base of knowledge from which alternative population trends may be derived. The lower and upper limits for population change can be constructed with some certainty, and reasonable judgments can be made about the likelihood of specific trends within that range. Such judgments may be based, in part, on survey data showing preferences and expectations related to marriage, childbearing, and family size.

In light of both the possibilities defined by demographic projections and the probabilities indicated by recent trends and by survey results (particularly surveys among young people), it appears that the following population changes are either certain or highly likely to occur in the United States in the coming years:

1. Total population size in the United States will continue to grow for at least two more generations. This growth will, of course, result in a higher population density overall.

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[a] This paper is a revision of a presentation given at a session entitled "Issues for Psychologists Involved in Population Research" held at the annual meeting of the American Psychological Association, Honolulu, Hawaii, Sept. 1972.

2. An increasing proportion of the population will live in the higher density areas of the country; that is, urban and suburban areas.

3. Family-size patterns will change substantially, particularly through a rapid increase in the number of women who choose to remain childless. There will also be an increase in the number of one-child families, but this change is likely to occur more slowly.

4. Prevailing patterns in timing of births also will be altered significantly, both in relation to age at marriage and spacing between births. These changes in timing of births, the specific nature of which cannot be forecast, will occur largely in response to the combined effects of increased female employment (including higher status employment) and greater availability of day-care facilities.

Let us assume, for heuristic purposes, that all of these changes are bound to occur in the coming decades. What will be the psychological consequences of such "inevitable" population changes? What kinds of research should psychologists be doing now to achieve some understanding, 5 or 10 years hence, of the impact of these continuing population changes? I will suggest some answers to those questions, but first let me quote the opening statement from the report[1] of a recent conference sponsored by the U.S. Center for Population Research:

> Currently in the United States, most population research in the social sciences focuses on the causes of demographic behavior (behavior affecting fertility, mortality, and migration). Sufficient knowledge of the consequences of that behavior—a vital requirement for the consideration and formulation of population goals—is lacking.

That statement clearly applies to psychological research in population as well as to other research approaches, and I would hope that psychologists will take it to heart. The topics to be studied are many and important; I can mention here just a few that follow from the predictions about population change given above.

POPULATION DISTRIBUTION

The emerging specialty of environmental psychology should have much to offer in understanding the psychological dimensions of changing population distribution. What are the important perceived characteristics of the individual's chosen area of residence? To what extent are people aware of changes in their demographic environment? What are the differences across generations in attitudes toward urban, suburban, and rural life? Is the need for privacy or open space something that will diminish with changing environmental circumstances, or is it something more basic in human nature? The answers to questions such as these will provide some insight about the individual consequences (and causes) of the distribution of population.

A related issue is the effects of population density and crowding. Here some useful beginnings have been made.

The consequences of population density is a topic that fits naturally within the context of social psychology, especially in the area of group dynamics, but density is a variable that has seldom been studied, and few conclusions about its main effects or interactive effects can be drawn. Freedman[2] has provided a comprehensive review of population density, covering research with both animals and humans. The literature on effects of crowding on animals is extensive and well known, but generalization to humans remains problematic. The largest body of research on humans is based on community correlational studies, for example, the relationships between density of an area and mental health or crime. It is difficult to isolate the effects of density in such studies. More recently, a series of experimental studies have been undertaken. It should be noted that these experimental studies also have an important limitation, namely, the short time of exposure to high-density conditions. The preliminary results are interesting, however, suggesting as they do that task performance is not affected by density but that emotional reactions vary by sex. In some experimental circumstances, men were found to react more negatively to high density, and women more positively. Curiously, however, these findings did not hold for mixed-sex groups.

There is need for a psychological definition of crowding, in terms of a perceptual, emotional, or motivational state, as opposed to density, which is a physical state. A recent article by Stokols[3] discusses that distinction. Another potentially important contribution is the article by Milgram,[4] in which the concept of adaptation to overload is used to analyze the psychological effects of living in cities. It seems likely that studies of the effects of crowding will play a prominent role in social psychology in the coming decades.

PATTERNS OF CHILDBEARING

It is surprising indeed that size of family has not often been treated as an important variable in research on child development. What is the effect on the child of number of siblings? Or, a more complex issue, what are the effects of number, sex, and age of siblings? This issue is dealt with in part in research on birth order, but few studies have been designed to permit an assessment of family size per se.

Thompson[5,6] and Clausen and Clausen[7] have provided excellent reviews of the effect of family size on parents and children. Both reviews, after examining the existing evidence, stress the need for better research designs to achieve firmer conclusions. It appears that children from smaller families generally perform better in a variety of areas related to verbal ability, perhaps because of more frequent interaction with adults. Measured IQ, for instance, tends to be higher in smaller families, even when other variables, such as socioeconomic status, are controlled. Findings on other topics, such as the effects of family size on social adjustment, are much less clear, although the weight of evidence points to more favorable outcomes for children in smaller families. A particular difficulty in interpreting research in this area is that the observed effects on children can be attributed either to differences in number of siblings or to differences in the type of parents who choose to have large or small families. Moreover, most of the psychological research on family size has been conducted in the United States or Europe. It seems reasonable to suppose that effects might be quite different in societies with different types of family structure or different childrearing practices.

Lieberman[8] has written a more selective review of the effects of family size, with a psychiatric orientation. A review from a pediatric viewpoint, dealing with physical and intellectual development of the child as well as maternal health and family welfare, has been provided by Wray.[9] Terhune[10] has recently reviewed both the actual and expected consequences of family size, giving attention to psychological, social, economic, and physical effects. These articles conclude that on balance the effects of large numbers of children or close spacing of children are undesirable, but again the research cannot be considered conclusive insofar as the independent effects of family size are concerned.

Apart from the general question of effects of family size on children, a number of more specific questions need to be examined.

1. What are the effects of voluntary childlessness (childfreeness) on the lifestyle and long-term "happiness" of couples?
2. Comparing the one-child family to the two-or-more-child family—
    a. What are the effects on the child? Is the stereotype about the spoiled only child supported empirically? Is there a self-fulfilling-prophecy effect here; that is, does a child respond to cultural expectations? If there are negative effects on the child in the United States, is this also true in European countries where the single-child family is more common?
    b. What are the effects on the parents of one child, such as time-energy demands and restrictions on personal freedom, compared with parents of two children?

c. To what extent does quality day care mitigate or reverse any negative effects, for parents or child, of the one-child family?

3. Is there a systematic effect on marital and sexual adjustment of the length of time between marriage and first pregnancy? Considering economic as well as psychological consequences, how do timing and spacing of births affect the perceived and real constraints on a couple's lifestyle?

4. For women who choose a career over childbearing, whether married or not, what are the specific positive and negative psychological effects? Is there adequate evidence for the position that maternal needs are biologically rooted, with the implication that alternative activities are not likely to be satisfactory substitutes for mothering?[11] What are the stresses on women who combine career and childbearing, through the use of day-care arrangements?

SOCIAL INDICATORS

In this brief paper I have described some of the psychological consequences of population change that seem worthy of research attention. If the population changes mentioned are inevitable, as indeed they are in large measure, then I would argue that psychologists ought to study their effects, out of a sense of social responsibility, to learn how possible negative effects might be mitigated. But in addition, many of the topics mentioned ought to be studied simply because they are important areas of human behavior and, as such, an essential part of psychological science.

As the new field of population psychology develops, there is perhaps a danger that it will go in too many diverse directions and thus lack cumulative impact. That trend would be particularly unfortunate with respect to psychological consequences of population change, which is by definition a topic to be studied over time. This possibility suggests to me the need to develop standard indices for key variables, such as attitudes toward the only child, with the aim of including those measures in broader studies of social indicators. We will certainly wish 10 years from now we had time-series data on many of the topics discussed in this symposium today, and I urge that we give attention soon to ways of collecting such data.

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Chapter 4

Neglected Psychological Issues in Population Research[a]

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The field of population research has a great need for new, imaginative approaches by psychologists. Past history stands in the way of many contributions, however. Population studies have been allied traditionally to, and have even been regarded as a branch of, sociology. This association has been in part a historical accident and in part a concomitant of the convenience of looking at population data in the aggregate.[1] Population studies have been considered to be aspects of the macrosystem of society, a kind of morphology, in which appropriate measures or rates based on large numbers are used. Many demographers are still uncomfortable with analyses based on cell sizes of less than 100 cases. The success of this point of view is shown by the fact that consistent regularities have been found and have been amenable to detailed mathematical and analytic treatment; further, large-scale trends in fertility, mortality, and migration have predictable effects on other social processes.

The methodology of population studies fits neatly into the general procedure of the sociologist. The tradition dates back to Durkheim,[2] whose main empirical work was a demographic study of suicide. His axiom was that social facts can only be understood by recourse to other social facts, not to individual motives.[3] Thus, while it is recognized that social trends are made up of individual actions, it is not deemed necessary to take the individual decision into account in explanation. A compelling analogy would be the random movement of particles that can be disregarded in observing the regularities of the behavior of large physical objects.

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The behavior of human individuals is not random, however, and the investigation of individual actions and the decisions leading to them are the province of the psychologist. Psychologists have had little interest, however, in attacking problems relating to the decisions leading to demographically relevant acts. The whole development of psychology as a science has been toward greater specialization, toward solving problems of specified aspects of human nature under controlled conditions. Concomitant with this development has been a split between the scientific and applied branches, the latter trying sometimes to encompass larger aspects but without much of the precision of laboratory science. A general study of population as a psychological problem falls between traditional psychological research and applied practice. It conceives individual lives as series of events and decisions adding up to the demographic trends observed in society. It may treat the person as a whole over his whole life and in his social and historical context. It will be the aim of this paper to show that population psychology can be regarded as an important field within psychology, and that this discipline may develop concepts that will be fruitful in bringing about an integration of psychological theory and research. But before dealing with this issue, let us return to the historical constraints that have led to the current situation of psychology *in* population studies instead of a psychology *of* population.

Fertility and its control have become matters of public concern in recent years. One expression of this concern has been the creation of programs that entail enlisting experts in many fields, eventually including psychologists. Diverse means have been used in this enlistment—tangible rewards, such as availability of funds, as well as intangible ones, such as social recognition and satisfaction in one's ability to contribute to society. However, the standard response of psychologists to the appeal of fertility control and population control has been to treat population problems just like any other topic to which their various theories and research approaches can apply, as an occasion to demonstrate what psychology can offer to population studies.[4, 5] If tomorrow another problem arouses popular interest and support, the same machinery can be employed with little shift in the actual scientific effort.

The techniques and theories that are adapted by psychologists to population problems have been worked out with great precision and detail beforehand as applying to certain particular aspects of the human individual. They are representative of the current fragmentation of psychology. They are psychology *in* population studies.

Before going on to discuss what a psychology *of* population could accomplish, let us acknowledge the real achievements of psychology *in* population. Psychologists interested in measurement techniques have been able to apply elaborations of psychometric technique to such questions as the desired number of children or the acceptability of contraceptive techniques.

Another kind of psychology that has been used is developmental psychology. The question of developmental psychology can become important when we ask how attitudes toward family planning have developed. Their interest leads these psychologists to look at childhood socialization, socialization into sex roles, how norms about having children develop, and how the fulfillment of a person might depend on the number of children he or she has. This area has now become especially important with the current interest in the female role and the question of differential socialization of sexes, such as the mother role becoming important for a woman and the achievement role for a man. Another question important in developmental psychology is the relevance of family size to the development of the child and to different childrearing patterns.

Another kind of psychologist, the social psychologist, is interested in the field of influence, communication, and group action. Family planning is not only an individual problem but a concern of the family group or of the couple. We can, therefore, study and apply the theories of group action and of the transformation of information into action within the family context, and apply these theories to family planning. Questions about communication, feedback, or methods of reaching agreement can be studied in relation to the introduction and persistent use of contraceptive methods. One of the important applications of this field has been the evaluation of these different methods, contrasting those that need little communication and little continuous application (sterilization is the extreme example) with those that have to be used consistently. The search for a better contraceptive then can be based on somewhat reasonable psychological theories.

To repeat, these techniques have made valuable contributions and have shown the power of the psychologist's skills. We shall now concentrate, however, on the impact that population studies can have on the psychologist's understanding. Demography can integrate the efforts of the psychologist in three ways: by showing the interrelatedness of biological and social conditions, by providing a framework for the study of the whole life cycle, and by providing a place for the application of concepts that have importance in a wide range of conditions, such as affect, emotions, identity, or time horizon.

We can look at the questions of fertility, growth, development and movement, stability, and decline of population as questions that concern the life and fate of the whole individual—a set of problems that could do much to integrate the whole field of psychological theory and research. These questions deal with the basic human drives and motives that have been translated into an elaborate set of learned activities as well as symbolic experiences. Population pressures lead to human social organization and to beliefs, attitudes, and opinions that may vary greatly. Thus, we have basic universal drives related to personality factors, to social learning, to beliefs and attitudes, and, further, to general social conditions. A problem with so many ramifications demands a unifying conceptual solution. Attempts at this solution would give a common orientation to many different branches of psychology. After all, the question of change and stability in population attacks the central concern of psychology, the nature and action of the human species.

The distribution and abundance of species is basically a biological question, and we must start with population biology. Here we assume that living organisms are motivated fundamentally by drives for survival of themselves as individuals and of their species. The latter is of great importance, leading to propagation and preservation of the young.

Looking at the pressure of these drives in a whole species, population biologists have been led to the theory of the niche.[6] A niche, a constellation of ecological conditions including other organisms, makes it possible for a species to survive and to reproduce itself up to a local maximum. The theory states that each species will fill the niche up to the capacity of the environment to support it. Change in this capacity can occur with environmental changes, such as climatic changes or invasion by a new species; it can also occur through evolution, adaptation, and maladaptation of the species itself.

In applying this principle to the human species, we see at once its different and peculiar characteristics. Man has been able to modify his niche through advances in technology and society, and has, at the same time, become adaptable to most environments. Changes in ecology that make possible an increase or decrease in human numbers are, for the great part, man made. Thus, while the concept of the niche is still valid for man, it must take into consideration some of the specifically human achievements and artifacts. For instance, the ecology of man and his environment changed when he became sedentary and agricultural. The neolithic revolution made possible a great population increase because of a dependable food supply. Similarly, the improvement of technology and urbanization in the Industrial Revolution was accompanied by a great population increase that has been studied under the name of the demographic transition. In both of these cases there was less adaptation in terms of evolutionary changes in the human species itself (although there may have been some of that) than adaptation in terms of man's own effort in molding his environment. Similarly, if the current prophets of ecological doom are correct, it will be man who has brought about the contraction of his own niche. The change in man's niche has been accompanied in great part by a social transformation. We can only speculate about changes caused by the neolithic revolution, but we have rather clear-cut evidence about the conditions surrounding the recent changes.

In effect, therefore, man makes his own niche. The abundance of the human species is limited mainly by man's ingenuity in providing support and in the social limitations that he has imposed on himself. The development of intensive agriculture—even more intensive in modern times—of housing conditions that can support higher density, and of transportation, communication, and industry has made expansion of the human species possible and has also set its limitations.

This dependence of population distribution and size on human action has made possible an assumption that the question of population control and other aspects of population are arbitrary in the sense that they depend on the social system, including such conditions as childhood socialization, adult socialization, and other processes of social influence. I have dwelt so extensively on the whole biological and evolutionary context in order to show that these questions are not simply those of limitless social molding, but are grounded in some deep-seated mechanism that governs the human species as well as the general organic evolution. The cooperation and integration of many fields of psychology can show the biological limits for population questions as well as the importance of social conditions and even historical events.

Population composition, distribution, and change represent problems that rest on well-recognized biological conditions but that have been given social and cultural meaning. We have presented a global, macrosystematic point of view in looking at the whole human species; for psychology, it may be more profitable to look at a corresponding individual aspect, namely, the study of primary drives. We would be concerned especially with drives that are connected with the propagation of the species, clearly one of the basic biological needs. These drives, however, are little discussed in most psychological treatments of drives.[7] From the purely biological-psychological point of view, the most discussed drive probably would be the sex drive, which can be measured easily, especially in animals, and whose biological manifestations are seen easily. The general tendency is to view propagation as a sort of necessary, even unfortunate, concomitant of sex. Motives specifically related to propagation usually are not dealt with specifically. What is called maternal drive, especially in animal psychology, is considered to be the drive of preserving the young once they exist, not a need for having any young or any particular number of them. This distinction, however, has become crucial now in the discussion of human population problems. Effective birth-control techniques have made the separation between sex and procreation extremely important and conspicuous. The number of children now presumably can be planned, independent of the sex drive itself. Do people—men as well as women—want children? Is this desire based on a basic need? What would be the consequences of thwarting or restricting this drive? Are there individual differences that we have to take into consideration? The answers are extremely important both to the general problem of understanding human life and to the specific problem of determining population policies.

The task of population psychology, therefore, is to take some of these biological constraints on the human species, insofar as they are expressed in psychological mechanisms, and to show how these basic conditions are modified into the interpersonal, social, and cultural conditions of individuals. Thus, population control is not simply attitude change, but attitude change in relation to a basic drive that might limit possible modifications. It is especially hard for psychologists to learn what is being modified and not only to show the ways in which the modification occurs. There is a distinct, connected field of population psychology with its own distinct problems. The variety of population changes and transformations and problems, in different places and over different times, gives us a great basis to work from. Data show both the limits of natural drives and of conscious social or individual controls. This is true of work in fertility as well as in other fields, such as migration, death control, and choice of occupation or residence. In each of these cases we have two basic structures. On the one side we have the given biological mechanism of the individual insofar as it is related to population problems. That is to say, there is a certain drive for reproduction, a certain susceptibility to mobility, mortality, possibility of changing, of migration, tolerance of density, and so on—the purely biological limits of the problem. On the other hand, there are some given social structures—the state of knowledge, the state of technology, the state of the economy and social mores—that also restrict the demographic morphology of the society. These are the limits in which the demographic process can play itself out. We can look at the translation of these factors, both the biological and the social, within the individual. Thus, the basic physiological restrictions will show themselves in something more clinical or in direct kinds of effects.

General questions to be asked are the following: What would be the effects of depriving people of offspring or other direct kinds of relationships involving having young around? How do mobility and change affect the human organism? How much variety in human relations is possible? How much density or loneliness is physically possible? How do social conditions mediate these biological limits? We can determine these limitations in field studies and experimentation as well as by considering the range of historical conditions. Some work of this kind has been done, for instance, on crowding and density.[8]

One of the unifying aspects of population studies is the transformation from biological necessities to social conditions. A second aspect is the expression of the unity of a person's life. There have been attempts by psychologists such as Bühler and Massarik[9] and Erikson[10] to look at the whole course of life as a unitary problem. Attempts have been made toward the delineation of stages of life; however, the ages on which most attention has been centered have been the earlier and later stages of life, especially the former. Another method for studying whole lives is not to look at development but at the common characteristics of persons' lives and their transformations under different conditions and ages. This method has been used in case studies in the new field of psychobiography or psychohistory, which tries to analyze the psychological unity and development of one particular prominent person. It is hard to generalize from these studies to typical human lives. The different events that are studied in demography, however, give a set of points against which to check a person's whole life. These events are crucial in most people's lives and are also common to a set of people. It is possible, therefore, to test which characteristics make a person act similarly in these different situations. Put another way, which are the psychologically meaningful, common features of all the topics of a person's present demographic history—schooling, occupational choice, marriage, fertility, social and spatial mobility, and reaction to sickness and death? Are there personality traits that can describe important patterns in a person's life—traits like changeability, competence, impulsiveness, or rationality? Or if there is no constant pattern, how does a person's reaction change from one stage to another? How are people affected by specific events? Can we look at different life events as a kind of Markov process that is partly determined by a person's constitution and partly by his experiences in between? What is the meaning of learning and experience over a person's life? Another approach may treat the influences on a person's life—how far the person is predictable through his family ties, how far through his family of origin, and how far through the situation in which he finds himself, such as under peer-group or other social pressures. Another psychosomatic approach might be to see how far certain physical conditions of a person can affect the whole course of his life and his reactions toward different demographic events. Finally, at the other extreme we might look at the different demographic events that happen to a person as a series of decisions and see whether the decisions stay constant or vary with events, or whether there are individual differences in the amount of control a person tries to exert over his life.

This kind of approach can be proposed as a general, psychological approach to population problems and demography. Given the theories and concepts of the psychologists, how can they describe and predict the demographic events in a person's life—their sequence and interaction? This work would help to unify ideas both in psychology and in demography. Demographers, too, have concentrated on somewhat specialized interests, such as fertility, migration, and mortality. Looking at a person as a unit, we can see how these different aspects really fit into the framework of a person's life. We might look at the problem as a kind of a grid having on one axis the studies of psychologists in learning, development, social conditions, and motivation, and on the other the different kinds of demographic events—fertility, mortality, mobility, and occupational choice. The first task, then, would be to find the relevant variables on both axes. The second task would be to show how the different concepts fit, how psychological concepts can explain a pattern of demographic events, and how demographic events are important in a series of psychological concepts.

The task of the psychologist ultimately would be to find those kinds of concepts that would be most efficient and fruitful in cutting through the whole series, through a whole set of demographic conditions. Here we might consider the uniqueness of demography in a person's life. In order to study that life best, we would have to find out what distinguishes demographic events from other things we might study in a person. If we cannot specify the difference, there would not be much sense in defining the field of demography from the psychological point of view. The events the demographer studies are usually very important in a life, the events that frequently describe the person's fate.[11] They lie within the realm of family, of important choices, of the whole style of life; they comprise choices that have great effects on a person's future and that are high-risk decisions, the effects of which cannot be estimated reliably. Thus, some of the concepts the psychologists might use in this field would be those that can cut across many situations and are perhaps not amenable to direct research on a small scale. These might include such traits as emotional set, risk taking, decision, identity, or time horizon—all examples of the kinds of concepts that have been studied but sometimes have involved difficulties when used in small-range studies because their meaning changes when longer time ranges are used or important decisions are studied. Also, in many of these cases it is important to look at the consistency of a person's actions over a variety of situations, all of which would have to be equally important—a condition that cannot be met except over a long term of a person's life, maybe decades. Many of these concepts may be vague, and it is exactly this vagueness that has led demographers to shy away from using them in studies and psychologists to be reluctant to apply them beyond the strict confines of the laboratory. It seems that overcoming the scruples of both disciplines and joining the emphasis at this point might invigorate the meaning of many of these concepts, which have been recognized as important but studied less than they should have been.

This issue, which I have tried to express in more conceptual terms, also can be discussed as a methodological problem. Here we would have the problem of the transition from the small-scale, precise work on individuals or small groups in a laboratory situation to the life of the whole society. We may look at it in three ways arranged as three steps, and in each of them we have a link between demography and psychology.

The first step would be to study the relation between variables within an individual or in a small group in a controlled setting. In this case we would not be interested in the actual existence of these variables in society, but just in the possible ways they could be related. This method, in effect, starts with psychological variables and ends with them. We can study personality relationships through such traits as decisionmaking characteristics or changeability, or consider the trait of changeability in relation to different choices. Thus, much of the psychological work in fertility today consists of relating one set of attitudes (questionnaire items) to another, but none of them to behavior.

The second step would be to conduct studies in a naturalistic setting—observation of the actual happening of events. This approach is restricted by the time limitations of the study and the small scale of the decisions made. But it is a useful method, for instance, in studying the effects of personal and situational characteristics on migration or fertility.

The third step would be to attempt to integrate the individual and the larger society, again by using as the intermediate step the lifespan of the individual. The study of the lifespan is a methodological tool that can be used in integrating the macro- and microsystem, the study of the individual, and the study of the whole society. Society is built up on the decisions of persons, and if we can understand the regularities of a person's life course, we might then understand how the rates the demographer studies are built up and how society as a macrosystem can be looked at as an entity in itself.

CONCLUSION

A comprehensive view of population conditions as a psychological problem includes three ways in which demography and psychology interact: the transformation of a basic biological need into social values and symbolic expression, the fitting of crucial life events into a comprehensive view of human lives, and the integration of the methodology of the micro- and macrosystem.

In each of these fields, psychological interpretations of population problems have much to contribute. A fresh look at many of the problems that have been dealt with routinely can find new research questions, only a few of which have been indicated here. The gap in knowledge that will become apparent as this approach develops will show the areas in which psychological research has been lagging because of its approach of separating problems into psychological processes rather than studying them intact. Thus, entrance into the discussion of human fate and human destiny (and this is one way of looking at demography) can give psychology a good mirror with which to look at itself, its strength, and its deficiencies.

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Chapter 5

Population Psychology Research Focused on Family Formation and Marital Relationships[a]

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This paper presents an orientation for psychological research in the population field. Research based on this orientation would consist of a series of short-term longitudinal studies focused on the family-formation process, and the primary unit of study would be the marital relationship. Data would be elicited from marital partners individually as well as collectively by setting up relatively controlled situations in which husband and wife would engage in childbearing-related discussions.

THE FAMILY-FORMATION PROCESS AS A RESEARCH FOCUS

Variations in human fertility, a focus of population research, may be construed as a function of differential patterns of family formation. Family-formation patterns may be characterized in terms of similarities and differences in such demographic variables as the timing of the first conception, the spacing between first and subsequent conceptions, the time required to conceive in the absence of contraception, the number and outcome of pregnancies, and the time at which childbearing is terminated.

The family-formation process, characterized by these demographic variables, poses numerous problems for psychological research. An overall research objective is to determine psychological antecedents and consequences of differential patterns of family formation within and between various population groups. Specific investigations would focus on the antecedents and consequences of particular reproductive events or stages in the family-formation process.

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The psychological antecedents most directly relevant to an understanding of the family-formation process and to the practical population problem of effecting voluntary changes in reproductive behavior are the motivations, conflicts, and decisions pertaining to childbearing. Research focused on these antecedents is more promising than studies of general personality characteristics that may be related to reproductive behavior. Consequences of the family-formation process pertaining to the mental health of family members are central to the field of psychology. Research focused on these consequences would include studies of changes in the relationships within the nuclear and extended family, following various childbearing-related events, and studies of the personal development of parents and children associated with differential patterns of family formation.

LONGITUDINAL STUDIES OF SUCCESSIVE STAGES OF FAMILY FORMATION

The motivations, conflicts, and decisions related to childbearing and the proximate mental health consequences of childbearing-related events are most reliably and validly studied during periods of time when these events are emergent or salient in the family-formation process. This approach requires short-term longitudinal studies of couples in the process of arriving at a childbearing-related decision or before and after the occurrence of a reproductive event.

For example, a longitudinal study of a sample of recently married couples followed up for only 2 or 3 years would make it possible to investigate, in situ, psychological antecedents and consequences of initial stages in the family-formation process. The period of time after marriage but before the conception of the first child could be studied to answer the following kinds of questions: What considerations lead to and maintain a couple's resolve to postpone childbearing? What are the differential effects on the marital relationship of postponing childbearing for various lengths of time? What circumstances or considerations result in a couple's risking pregnancy through contraceptive negligence before reaching a decision to have a child? What are the conditions and circumstances in which a couple feels ready for childbearing? What considerations are involved in a couple's decision to begin childbearing? What individual and marital conflicts are generated by the prospect of childbearing and the anticipations of parenthood? Do childbearing conflicts affect contraceptive behavior? What motivations, conflicts, or life plans are associated with a couple's decision not to have children?

The occurrence of a planned or unplanned pregnancy during this initial period of a longitudinal study provides a natural experiment in which conditions before and after conception and childbirth could be compared. What marital problems and changes in marital patterns are generated by pregnancy and the advent of the first child? What childbearing conflicts emerge or are resolved during pregnancy? What are the psychological antecedents and consequences of complications during childbirth? What are the antecedents of adverse postpartum reactions? How do the anticipations of parenthood compare with actual parental experiences? How do the experiences of childbirth and infant care affect motivations for further childbearing?

Couples in a longitudinal study who desire children but find they are unable to conceive or carry pregnancy to term would constitute a sample for research on infertility, artificial insemination, and adoption. Do childbearing conflicts contribute to subsequent problems of conception or the occurrence of miscarriages and spontaneous abortions? What childbearing motivations and conflicts are generated by the inability to bear children? If infertility results from a reproductive dysfunction of the husband, what considerations make childbearing through donor insemination acceptable or unacceptable to either husband or wife? What marital or parent-child problems are generated by family formation through artificial insemination? What considerations lead an infertile couple to seek a child through adoption rather than to remain childless? What special problems characterize family formation through adoption? Does the probability of conception among infertile couples increase following adoption, as is often assumed?

Studies following the initial period of family formation could be directed to determining changes in childbearing motivations for each successive child and the considerations involved in child spacing. What are the circumstances in which a couple feels ready to have a second or third child? What are the effects of differential child spacing on the relationships between parents and children and among siblings? What considerations lead a fertile couple to adopt a child rather than have an additional child? In families formed of both biological and adopted children, what is the nature of the relationships that develop among family members?

Longitudinal studies of the final stages of family formation could be directed to the following questions: What are the individual and marital effects of voluntary childlessness? What conflicts are evoked by the prospect of terminating childbearing? What motivating considerations lead a couple to cease childbearing after having one, two, three, or more children? What are the marital and individual effects of a pregnancy following the planned termination of childbearing? If a pregnancy occurs after a husband and wife have decided to cease childbearing, what considerations lead them to interrupt the pregnancy through abortion or to carry the pregnancy to term? What are the motivating considerations in a decision to prevent further childbearing through voluntary sterilization? What differences in motivations and effects are associated with the decision for a tubal ligation rather than a vasectomy?

Studies starting with the beginning symptoms of menopause could focus on the following kinds of questions: What are the effects of approaching menopause on the couple's contraceptive vigilance? Does approaching menopause reactivate childbearing motivations, evoke childbearing regrets, or induce greater interest in or desire for grandchildren? How do parents' desires for grandchildren enter into the childbearing motivations of their married children?

The juxtaposition of a series of short-term longitudinal studies of couples entering successive stages of family formation would make it possible to identify psychological antecedents and consequences of the entire family-formation process. It is assumed, of course, that the design of such psychological research would take into account those social stratification variables that are known, through sociological studies, to be associated with reproductive behavior. That is, either research should be designed to identify the psychological conditions associated with variations in the patterning of reproductive events among couples similar in religion, race, socioeconomic status, education, urban-rural residence, and so forth, or the investigation should be designed to determine the psychological conditions associated with the differential family-formation patterns that characterize these population groups.

Although the research suggested requires representative samples of clearly defined populations, the planning of such research would benefit by exploratory studies in which a small number of cases were studied intensively through time. Intensive case studies would provide data for conceptualizing the phenomena under investigation and for developing hypotheses to be tested in large-scale research. Especially illuminating would be an intensive analysis of the childbearing motivations and conflicts of couples whose patterns of family formation deviate from those that are prevalent in the social groups of which they are a part. Such analysis would include couples who plan to have more children and couples who postpone childbearing for a considerably longer period of time than their siblings, friends, and acquaintances. Of special interest would be couples who plan to remain childless or couples who cease childbearing after having one child. Also of interest would be infertile couples who demonstrate no reproductive dysfunction sufficient to account for their inability to conceive, or fertile couples who complete their family through adoption.

THE MARITAL RELATIONSHIP AS THE PRIMARY UNIT OF STUDY

The most relevant unit for studying the family-formation process is the marital dyad. While it is an obvious biological fact that childbearing requires a sexual union between a man and a woman, it may be less obvious that motivations, conflicts, and decisions related to childbearing are conditioned by, if not formed in, the context of the marital relationship. When husband and wife evolve childbearing plans in marital discussions, or when childbearing decisions are jointly arrived at, the relevance of the marital relationship in the process of family formation is apparent. Even when there is little communication between husband and wife related to childbearing, however, the family-formation process reflects the relationship between husband and wife. For example, a husband's compliance with his wife's reluctance to engage in sexual intercourse during the fertile period of her menstrual cycle although he desires a child, or a wife's continued contraceptive vigilance when she desires a child but her husband does not, can only be understood fully in terms of the nature of their relationship. Similarly, a wife's unilateral decision to obtain an abortion or to become sterilized can be understood only in the context of her relationship with her husband.

Individual motivations for childbearing may be a function of the nature of the satisfactions and dissatisfactions in the marital relationship. A wife may look forward to a relationship with a child as a substitute for a dissatisfying relationship with her husband, or a husband may want a child to diffuse his wife's demands for attention and companionship. A husband and wife may be reluctant to have children because they anticipate that a child would intrude upon or disrupt a satisfying marital relationship; on the other hand, they may want a child as a symbol of their love and commitment to each other.

A marriage in which the husband relates as a dependent child to a maternal wife may evoke different childbearing conflicts from those evoked by a marriage in which the husband assumes a paternal role in relationship to a childlike wife. In the former marriage, the wife may be concerned that her dependent husband will become jealous of the attention and affection that she would give to a child, while in the latter marriage, the husband may be concerned that his childlike wife will be reluctant to assume the responsibilities of motherhood.

Not only the antecedents but the psychological consequences of the family-formation process may be a function of the relationship between husband and wife. For example, the nature of the marital relationship may contribute to the following:

1. The effects of an unplanned pregnancy or of the inability to conceive when a child is desired
2. How a woman experiences her pregnancy and her postpartum reactions
3. The psychological effects of a spontaneous or voluntary abortion
4. The psychological consequences of sterilization
5. The evolving experiences of parenthood
6. The nature of the relationships that develop between parents and children and among siblings
7. The psychological effects of family size

Although the marital context is central for understanding the psychological antecedents and consequences of the family-formation process, most studies related to childbearing have focused on women. Data pertaining to husbands or to the marital relationship have been elicited primarily from wives. In those few instances in which both husband and wife have been included in the study, data have been collected separately from each partner through individual interviews or questionnaires. To understand more fully the family-formation process, research is needed in which the husband and wife are studied as an interacting unit.

EVOKING MARITAL DISCUSSIONS FOCUSED ON CHILDBEARING

A difficult but promising approach for studying childbearing motivations, conflicts, and decisions in the context of marital interaction would be to set up relatively controlled situations in which husbands and wives would be asked to discuss with each other their childbearing plans, probe each other's childbearing motives, and attempt to resolve childbearing conflicts or arrive at childbearing decisions. For example, Strodbeck's[1] "revealed-difference technique" can be adapted to evoke marital dialogs related to childbearing. In this technique, couples would be asked to attempt to resolve differences revealed in their individual responses to questionnaire items pertaining to various aspects of family formation, such as family-size and child-spacing preferences, preferred course of action in the event of an unplanned pregnancy, or the possibility of predetermining the sex of a prospective child.

The Q sort may be used as a revealed-difference technique as well as a technique to assess systematically the childbearing motivations of husband and wife and their understanding of each other's motivations. This method would involve instructing both partners to Q-sort a set of motivational items in accordance with their own childbearing dispositions. Then each would sort the items as he or she assumes the partner would sort them. They would then be asked to discuss with each other the meanings they attribute to the salient items in their self-sorts and the assumptions underlying the attribution of childbearing motivations to the partner.

Role playing has been used by the author to evoke marital dialogs focused on childbearing. For example, a couple may be instructed to try to resolve a marital difference in readiness for parenthood in order to arrive at a decision. Similarly, discussions may be initiated related to the decision to have a second or third child or to terminate childbearing. Or role-playing enactments may be initiated by asking a childless or one-child family to pretend that a reproductive dysfunction in the husband or wife obviates childbearing, or by instructing a couple who does not want any more children to pretend that a suspected pregnancy has been confirmed. To clarify the meanings implicit in a role-playing enactment, a tape recording of the role-playing episode is played back for retrospective analysis and interpretation by the couple. The juxtaposition of the partners' recorded role-playing enactment with their own interpretations of their behavior maximizes the value of both self-reports and direct observation of marital interaction as methods of investigation.

The author[2] has designed a number of strategies for evoking marital discussions related to childbearing, one of which has been referred to as a "delayed marital dialog." To initiate a delayed marital dialog, the interviewer instructs the wife to ask her husband a series of questions focused on his motivations or concerns related to childbearing. The husband is not permitted to respond until his wife has completed formulating all the questions that occur to her. At that time he is instructed to answer her tape-recorded questions, as they are played back to him one at a time. After he has answered each question, he and his wife discuss the meanings involved in both question and answer. The procedure is then reversed; the husband asks his wife a series of questions, and she answers each played-back question according to the same instructions.[b]

For each delayed marital dialog the interviewer provides instructions that specify the content area and focus of the questions to be asked. For example, a spouse may be instructed to formulate questions that complete one of the following phrases: "Do you want a child in order to . . .?" "Are you reluctant to have children because . . .?" "Are you postponing having children because . . .?" "Are you ready to have a child at this time because . . .?"

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[b] As each question is played back, it is recorded along with the partner's answer on a second tape recorder. Thus, a continuous marital dialog of questions and answers is produced on one tape for subsequent transcription and analysis.

Because of the intimate familiarity that husbands and wives have with each other, questions asked by each tend to be more personally relevant and meaningful than a standard set of questions asked by an interviewer. Marital partners tend to be highly motivated to answer each other's questions and to clarify any misunderstanding suggested by the questions.

Marital discussions evoked by the kinds of strategies described would enable the investigator to determine the constellation of meanings husbands and wives attribute to childbearing and parenthood, the considerations underlying childbearing plans, the arguments presented in trying to resolve childbearing conflicts, and the reasoning involved in arriving at childbearing decisions. In addition, such discussions could be used to analyze the patterns of marital interaction involved in the emergence and resolution of childbearing conflicts and in the process of arriving at childbearing decisions.

SUMMARY

This paper focused on the family-formation process as a framework for generating psychological research in the population field. A series of short-term longitudinal studies during successive stages of family formation was suggested as an overall research design, and questions were raised for guiding research related to particular reproductive events or stages. Finally, the marital relationship was designated as a promising unit for studying the family-formation process, and approaches for evoking marital discussions focused on childbearing were indicated.

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Chapter 6

The Target That Talks Back: Personal Communication and Population Research[a]

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People bear little resemblance to targets, whether the targets are metal, straw, or simply tin cans at which one shoots. Targets neither return nor reshoot the arrow or bullet; population communication targets do. When the communicator speaks of the target audience, he unfortunately may act as if the receivers of the communications actually have targetlike characteristics. They do not. They talk. They think. They communicate back and they communicate with each other.[1]

When we deal with population communication, the target notion is particularly inappropriate. Most basic attitudes, values, and norms about population involve communication over long periods of time and with many persons as well as the mass media. Let us consider a few examples. How and when does each person acquire his attitudes and values about each of what Davis and Blake[2] call the "intermediate variables" affecting fertility? Should one marry? What is a proper age to marry? What coital frequency is normal? Is contraceptive use tolerable? Is induced abortion morally justifiable? Should one become divorced or separated or desert a spouse? If one is widowed, should one remarry? All of these questions involve communication.

The family communicates (or fails to) on these questions. School books and peers communicate on these questions. In fact, virtually constant communication takes place on these questions. The stuff of gossip (extramarital affairs, divorces, etc.) is heavily endowed with population-related messages. Until we begin to realize such basic facts, all population communication campaigns and all population communication research will remain a bit disreputable.

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[a] Reprinted with permission from *World Communication: Population Communication, Communication Technology, Communication in the Future*. Pp. 18–21. Proceedings of the Conference on Major Issues in World Communication. Honolulu. East-West Center, 1973.

Let us set a not too unrealistic scene. The clever researcher fresh from graduate school carefully plots his ingenious experimental design; he will test a communication campaign in experimental and control areas of a big city. In the experimental areas, he will do the newest and best of everything by way of mass media communicating. In the control areas, he will do nothing. He will have before-and-after measures. He will be a scientist. But you and I know his experiment is full of flaws. People talk; most of them do not know about experiments and probably would not be terribly impressed if they did know. Our clever fresh Ph.D. claims contamination, hangs his head and weeps, and finally decides communication research is not all that interesting anyway. No doubt he could become a demographer or perhaps a passable fisherman. Or perhaps he could become divorced and forget his professional troubles—bringing us full cycle back to the fact that the stuff of gossip is population communication.

Directed change of population communication is no simple matter to be left to amateurs. If the survival of the species hangs on population matters (and it does), it is worth more than extensions of theoretical statements from research on political, agricultural, beer, or deodorant communications. A major effort must be initiated and pursued with some intelligence and integrity.

We may begin by dispensing with the simplistic idea that urban-rural residence, educational attainment, ethnic groups, income, and other such variables explain most differences in population behavior. There are more theoretically appealing and intuitively explanatory factors than these, and I believe communication patterns are one of these more appealing factors. Part of what we measure in urban-rural differences, for example, is differences in communication patterns. Besides, if our goal is a meaningful guide to social planning and social policy, it is easier to change communication strategies (and hopefully alter communication patterns) than it is to change whether someone lives in an urban area or a rural village.

Having dispensed somewhat heretically with much conventional sociological wisdom, I come to the weak point: What research should we do and how should we do it?

Critical questions are easy to ask. A few we might ask follow:

1. Who are the population influential persons and opinion leaders? Is the IUD opinion leader the same as the influential person on the pill or the feasibility of divorce? Of marrying young? How do the characteristics of opinion leaders vary from society to society or one

type of communication campaign to another? What factors either impede or facilitate the interpersonal communication process?[1,3]

2. What life-cycle and developmental changes are there in interpersonal communication patterns about population? Surely certain topics for communication are of interest only to youth, others only to old folks.

3. What are the population-related messages already carried by mass media? What do the novels say? The magazines and newspapers? The radio and television? The back of the breakfast cereal box? How do these messages become changed when they enter the personal communication networks?

4. What virtues and vices are there in linking population control to pollution control in communication campaigns? How do such linkages affect the interpersonal communication processes?

5. What is the current status of the art of producing procontraceptives propaganda? That propaganda is based on many assumptions about interpersonal communication.[4] What are the assumptions and are they correct for each culture with which we communicate?

6. In what ways do results of the experiments in social psychology fit with population communication research? Do the results on primary recency, public versus private decisions,[5] and the like apply for population messages? Do such results apply to interpersonal communication as well as impersonal communication?

7. What factors affect communication between spouses on population-related matters?[6]

8. What interpersonal communication factors affect the long-term selective perception and retention of population messages carried by mass media?

9. Can the mass media be used for more than simply stimulating awareness and imparting legitimacy to population-related issues? If so, how?[7] How can one use the mass media to stimulate favorable interpersonal communication patterns on population messages?

10. To reverse the variable being studied to the one that is our explanatory focus, we can also ask how population facts affect the communication processes:

   a. How does population density affect the efficiency and types of interpersonal communication that occur?
   b. How does the age or sex structure of a population affect the interpersonal communication patterns?

These questions (and many others) are relatively easy to ask. Specification of the needed research designs is more difficult. I offer no simple solutions. Great questions require great researchers. However, the rest of us may start with relatively pedestrian matters. What is the current status of mass communications in population? What is in our school primers, our newspapers, our magazines, our television, and our radio? A few careful content analyses of the media would be useful. They contain (often implicitly) messages on marriage, divorce, intercourse, death, geographic mobility, and more. Are the messages in the mass communication known by the people who receive them?

How about other forms of communication? The laws on population matters are a good case for illustration. The population communication messages contained in laws on bigamy, income tax deductions for dependents, divorce, public housing eligibility, maternity benefits, women's rights, and the like should not be overlooked.

In our research designs, we need more long-term panel studies, experimental studies, and a more interdisciplinary effort. We will not succeed in answering the big questions solely using cross-section surveys and secondary analyses of knowledge, attitudes, and practice survey data. Neither will we succeed only trying out old ideas in new settings.

It is frightening, at least to me, that so much money is being spent on family-planning pamphlets, leaflets, posters, slides, short films, and radio spots while so little money is being spent on research to see how good or effective these devices are. So much of the propaganda currently in use seems to be simply translations from one country to another, all carrying similar messages.

I am also worried because we have not really tried the kind of intensive and extensive communication campaigns that may be required and, therefore, cannot assess many uses of communication devices simply because we have never tried them.

To reiterate, population communication is not simply another form of beer commercial. We are talking about basic, important issues when we deal with population communication and I do not believe the target audiences will be convinced by yet another beer commercial with a family-planning message.

We have to learn more about our talking targets. I suppose we must entice our fresh Ph.D. to recognize that population communication research is a trying business, but it is also a challenging and worthwhile pursuit. The talking targets may contaminate neat research designs, but all they are doing, after all, is communicating. That is what our fresh Ph.D. forgot. Rather than measure what the mass media do, he should be concerned with the interpersonal communication stimulated by the mass media. The talking is not contamination; it is exactly the effect one should study.

I do not believe people are targets. They are, instead, communicators who are very active indeed in their communication campaigns. Our research should be directed to understanding the how, what, when, where, and why of true population communication. The mass media or other devices we use should be seen as simply one small input into an ongoing, everyday population communication process.

In summary, my main point is simple: people are not targets; they are the population communicators.

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PART II

Methodological and Theoretical Issues

Chapter 7

Some Methodological Explorations in Forecasting Family-Planning Behavior[a]

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INTRODUCTION

In October 1969, the American Psychological Association (APA) established a Task Force on Psychology, Family Planning, and Population, giving official recognition to the discipline's nascent interest in this vital field of inquiry. Although individual psychologists such as David,[1] Fawcett,[2] Pohlman,[3,4] and Rainwater[5] had already initiated important programs of research prior to APA's action, few of their colleagues were aware of the extent and complexity of the demographic problems awaiting study. One must admit to a certain embarrassment in regard to psychology's late arrival on the scene, particularly in view of the decades of worthy involvement on the part of other social sciences such as economics, political science, and sociology.

The recency of psychology's entry into the family-planning research arena dictates, among other things, the kinds of research questions that must be asked. One of these questions concerns concepts and variables; that is, what motivations, dispositions, traits, aptitudes, skills, etc., will be relevant to family-planning criteria and which of these variables will be most powerful, singly and in combination, in predicting significant outcomes? Another deals with methodology; that is, which tools of assessment, methods of analysis, and techniques for combining indices will function best in classifying individuals and forecasting what they will say or do? A third concerns theory; that is, what inferences about human behavior and its determinants can be

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drawn from empirical findings in regard to constructs and competing methodologies?

The inchoate state of psychological inquiry in the field of population means that a new study can begin almost anywhere and, with reasonable good fortune, attain findings that will contribute to a better comprehension of the domain. Perhaps the best plan is to proceed in an exploratory manner—seeking out those variables that show promise and those methods of analysis that appear to open up new and improved pathways. Subsequent study can then pin down specifics and recheck conclusions so as to correct preliminary errors and sharpen the focus of future investigation. The analyses to be reported in this paper have been undertaken in this frankly propaedeutic and exploratory spirit.

TARGET VARIABLES, SAMPLES, AND INSTRUMENTS

To keep this discussion within sight of recognizable landmarks of family planning, it was decided to work with three target variables: number of children wanted, contraceptive preferences among women, and vasectomy as a contraceptive choice among men. Each of these target variables has a more or less self-evident importance, and none appears to have yielded so far to a predictive methodology. Fawcett,[2] for example, stated that there is an urgent need to develop methods for assessing family-size preferences; Pohlman[4] concluded that major studies had achieved little success in relating psychological variables to dependent criteria in the birth-planning realm.

Three research samples will be employed in the analyses to follow. The first includes 78 males and 100 females who were administered a battery of tests and questionnaires in 1970–72. The male subsample consisted of 25 adults participating in a community survey of environmental attitudes, nine other adults seen in individual testing by the author, and 44 college students who took the tests as part of their laboratory assignments in introductory psychology. The females included 25 from the community survey, 35 mothers with children in a cooperative nursery school, and 40 college students. Mean age for the 34 adult males was 41.91 (*SD* = 12.91); for the male students, 20.05 (*SD* = 2.88); and for all 78 males, 29.58 (*SD* = 13.88). Mean age for the 60 adult females was 34.82 (*SD* = 10.28); for the female students, 19.95 (*SD* = 2.02); and for all 100 females, 28.87 (*SD* = 10.82).

The second research sample was composed of 50 married couples interviewed and tested in 1973.[b] All of the couples had at least one child enrolled in the primary grades of a nearby community. The mean age of the husbands was 33.60 (*SD*=5.72), and of the wives 31.50 (*SD*=4.68). The third research sample included 73 couples described by Ziegler, Rodgers, and Prentiss,[6] 38 of which were being counseled in regard to vasectomy and 35 in regard to the use of ovulation suppressors for contraceptive purposes. Psychological test data available for this third sample included only the three scales of the Personal Values Abstract:[7] modernity (My), socialization (Sn), and femininity (Fy).[c]

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[b] The testing and interviewing was carried out by Michael Tiktinsky and JoAnn LeMaistre, graduate fellows in psychology at the University of California, Berkeley, at the time of this study and research assistants on the writer's staff.

Subjects in the first two samples completed five assessment devices. The first was the California Psychological Inventory (CPI),[8] a 480-item true-false questionnaire scaled for 18 dispositions such as dominance, sociability, self-control, and flexibility, conceptualized as derivatives of interpersonal living and hence as "folk concepts" relevant to social behavior in any culture, place, or setting. The second was the Personal Values Abstract (PVA) just mentioned. The PVA contains scales and items drawn from the CPI and is addressed specifically to norm-setting, norm-observing, and norm-changing dispositions of particular pertinence to family-planning behavior.[7]

The third device was Rotter's[9] scale of locus of control (LOC), pitting expectations for external (higher scores) versus internal (lower scores) control and reinforcement. The scale has presumptive relevance to birth-planning issues, and there is also empirical evidence[10] concerning such relationships.

The fourth measure was an unpublished test of sexual knowledge developed by Miller and Fisk.[d] The original version of the Sexual Knowledge Questionnaire (SKQ) contained 49 items. The version used in the present inquiry was a 24-item edition including only those items with high item versus total score correlations.

The fifth device was a questionnaire concerning the acceptability of 10 contraceptive methods, described in an earlier paper.[11] Factor analysis of this set of 10 methods identified four groupings: (1) coitus dependent—condom, diaphragm, and foam or jelly; (2) surgical—vasectomy and tubal ligation; (3) coitus inhibiting—abstinence, rhythm, and withdrawal; and (4) coitus independent—intrauterine device and pill.

All subjects in the first two samples were also asked how many children they expected to have and a second question, "How many children would you like to have?"

Descriptive statistics on the five measures for the first two sam-

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[c] Scoring of the three Personal Values Abstract scales on these subjects was generously provided by David Rodgers of the Cleveland Clinic and Frederick Ziegler of the Carmel Community Hospital, Carmel, Calif.

[d] The writer is indebted to Warren Miller and Norman Fisk of the Department of Psychiatry, Stanford University School of Medicine, Stanford, Calif., for their kindness in permitting use of this test.

TABLE 1.—*Means and standard deviations on the variables indicated for four samples and correlations between husbands and wives*

Variables	Males[1]		Females[2]		Husbands[3] (h)		Wives[3] (w)		$r_{h,w}$
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
California Psychological Inventory:									
Dominance (Do)	28.90	6.00	27.64	6.39	29.36	5.67	26.56	6.62	−.02
Capacity for status (Cs)	21.19	3.12	20.91	4.40	20.66	3.33	20.50	3.88	[4].40
Sociability (Sy)	24.94	4.41	23.82	5.32	24.10	4.76	22.98	5.06	.10
Social presence (Sp)	38.76	5.15	37.10	6.40	37.58	5.43	35.52	5.40	.13
Self-acceptance (Sa)	22.32	3.73	21.46	3.78	21.74	3.46	20.92	4.44	.13
Sense of well-being (Wb)	26.32	4.42	34.40	5.55	35.94	3.94	34.62	5.05	.14
Responsibility (Re)	28.60	4.84	30.51	4.97	28.30	4.78	31.00	4.42	[4].37
Socialization (So)	35.60	5.39	36.22	5.51	34.62	4.99	37.40	4.94	.17
Self-control (Sc)	27.68	6.87	28.19	7.14	28.90	5.98	30.64	6.79	.20
Tolerance (To)	22.96	4.64	23.18	4.55	22.18	4.36	23.00	4.11	.21
Good impression (Gi)	16.73	5.89	15.72	5.49	16.98	5.18	15.58	4.89	.12
Communality (Cm)	25.06	2.40	25.17	2.02	24.26	3.45	25.84	1.67	.01
Achievement via conformance (Ac)	27.58	3.82	26.80	4.60	28.14	4.49	27.00	4.76	.16
Achievement via independence (Ai)	22.09	4.32	21.98	3.92	21.64	4.45	22.88	3.87	[4].46
Intellectual efficiency (Ie)	39.59	5.11	39.11	5.60	39.30	5.25	39.12	5.67	.24
Psychological-mindedness (Py)	12.54	2.94	12.46	2.68	12.52	3.43	12.30	2.82	.21
Flexibility (Fx)	11.86	4.69	12.34	3.75	10.56	4.08	11.44	3.97	[4].48
Femininity (Fe)	17.68	3.34	23.34	3.26	16.80	2.99	24.86	3.23	−.17
Personal Values Abstract:									
Modernity (My)	21.53	3.51	20.63	4.39	20.38	3.57	20.28	4.41	[4].36
Socialization (Sn)	23.50	3.80	23.80	3.68	22.28	3.76	24.56	3.69	.11
Femininity (Fy)	15.78	3.16	21.19	2.96	15.06	2.76	22.66	3.34	−.26
External locus of control	10.10	4.01	10.05	4.47	8.24	4.63	9.82	4.51	[4].56
Sexual Knowledge Questionnaire	15.29	3.94	17.52	3.26	17.00	2.51	19.10	2.44	.26

Contraceptive preference factors:									
Coitus dependent	10.20	2.23	9.76	2.27	7.73	2.22	6.76	2.23	.09
Surgical	6.77	2.86	7.43	2.57	7.84	1.74	7.99	2.07	.23
Coitus inhibiting	4.39	2.10	3.90	1.75	3.17	1.60	3.17	1.40	.24
Coitus independent	7.79	1.79	7.72	1.90	6.04	1.39	6.71	1.17	[5].32
Number of children wanted	2.71	2.00	2.64	1.11	2.59	2.03	2.41	.88	.25
Number of children expected	2.34	1.45	2.21	1.18	2.33	.95	2.31	.99	[4].83
Age	29.58	13.88	28.87	10.82	33.60	5.72	31.50	4.68	[4].78

[1] $N = 78$.

[2] $N = 100$.

[3] $N = 50$.

[4] $p \leq .01$.

[5] $p \leq .05$.

ples are given in table 1. On the CPI, means are in raw score form. If expressed in standard scores, highest values for males in both samples are found on the scales for social presence, self-acceptance, achievement via independence, and flexibility; the lowest point for both samples was on good impression, suggesting that no particular effort was made to put forward a conventionally desirable self-portrait. All of the CPI means fell within one standard deviation of the normative median for each scale. For the two subsamples of females, all 36 mean scores also fell in this same central range: highest scores were on the scales for achievement via independence and flexibility, and lowest scores were on the scales for well-being and good impression.

Scores on the other scales and variables were all within normal limits insofar as normative information is available. Sex differences, as they occurred, were also in the expected direction. For example, on the two scales for femininity (Fe on the CPI and the shorter Fy scale on the PVA), women scored significantly higher than men. Unpublished data on the Miller-Fisk SKQ showed women usually scoring above men. This differential is found in both comparisons in table 1. The expected increment in number of children wanted over number expected is also observed; it should be noted, however, that this discrepancy is more typical of American than of European attitudes.[12]

Table 1 also presents correlations between husband and wife on each of the 30 variables. Assortative mating clearly prevails, as all but three of the correlations are positive. On two of those correlations showing negative coefficients (Fe and Fy), the dyadic relationship is nonetheless understandable (i.e., if the wife is more feminine, the husband is more masculine).

The coefficients of greater magnitude ($p \leq .01$) are of particular interest, as they may be regarded as key elements in the marital bond. One could formulate a tentative hypothesis along these lines: males will tend to marry females (and vice versa) who are of similar age and who have similar drives for status, beliefs concerning ethical and unethical behavior, capacities for independent effort, preferences for change and new experience, faith in rationality and social progress, and expectancies about the nature of social control. Other kinds of mutuality, such as social skill and poise, assertiveness, sociability, psychological-mindedness, and even contraceptive preferences will be of distinctly less importance.

NUMBER OF CHILDREN WANTED BY WOMEN

The first target variable to be considered is number of children wanted by women. Four methods of relating personality and attitudinal data to this target will be reviewed: regression equation, decision tree, typological classification, and conjoint analysis. Subjects will be the 100 females in sample 1, for which the mean number of children wanted was 2.64 (*SD*=1.11). Surveys of the number of children wanted[13, 14] suggest that a mean of about 3 is typical in recent years and for various subsamples. Since 1941, there has been a fairly consistent drop in estimates of the ideal number of children.[13, 15] The way in which the question about ideal number of children is framed will influence replies.[16]

The figure of 2.64 may reflect a recent trend toward smaller ideal family size and may also reflect the specific wording of the question; that is, on the continuum from ideal to desired to expected or intended, the question asked of the 100 women may have shifted replies toward the "desired" zone and somewhat down from the "ideal." Nonetheless, the mean of 2.64 is not overly discrepant from values reported elsewhere, and there is sufficient variance to permit analysis of different methods of prediction. Prediction, in the sense to be employed below, is not prediction over time, but rather an estimation of the stated number of children wanted based on other scores and responses of the individual. The logic of predictive analysis is used, but the purpose of the analysis is to bring into visibility associated networks of belief and attitude that may help to account for the criterion response. The fact that ideal number of children varies somewhat over time, place, and circumstance suggests that it is an outcome or product of influences originating in and impinging on the individual.

Step 1 in the analysis is to see if any of the separate scales or tests correlate significantly with the target variable. On the CPI the values ranged from a low of −.11 for the flexibility (Fx) scale to a high of .25 for socialization (So). The latter is significant at the .05 level, but not as high as one would expect to find for a combination or cluster of variables. Locus of control correlated .01, sexual knowledge .06, and age −.01, so these indices do not appear to hold much promise.

Failure to find any single scale with acceptable predictive power means that clusters or combinations of scales must be reviewed. Multiple-regression analysis, in which errors of estimation around the plane of forecasting defined by the equation are minimized, is an easy and obvious method to apply to our problem. The best five-scale equation yielded in a stepwise solution was this: .792 − .034Wb + .055So − .023Gi + .102Cm − .050Fe (where Wb is sense of well-being, So is socialization, Gi is good impression, Cm is communality, and Fe is femininity). The weights in this equation are for use with raw scores on the CPI. Scores for the 100 subjects were computed, using this equation, and then these estimates were related to the actual number of children wanted. The mean of scores on the equation was 2.65 (*SD*=.41), and their correlation with the target variable was .36.

A tentative interpretation of the psychological meaning of the equation can be made on the basis of the scales and their weightings. Women who want a larger number of children tend to rank lower in general sense of well-being, to be more conventionally socialized, to be less interested in making a good impression, to be more modal (less individual) in personality and outlook, and to have a less feminine pattern of interests; more and less in this sketch is always in reference to women who want a smaller number of children.

The second exploratory analysis is by way of a decision tree. A regression equation, however long or complicated in its internal weighting, is always additive and linear, and its components are combined in the same way for all subjects. In the decision tree, choices made at each point of branching are simple and linear, but the totality of the tree allows for nonlinear interactions, and partitioning of subjects into homogeneous subsets for which specific decisions can be made without regard to subjects in other cells or branches of the tree. Whether a decision tree erected from any set of data will be less powerful or more powerful than a linear regression equation based on the same data pool is an empirical question.

In our example, the tree can be initiated with the CPI scale having the highest correlation with the target variable; this scale is So, with a coefficient of +.25. Because this coefficient is considerably higher than the next candidate, let us start the growth of the tree with three branches: (1) subjects with So scores ≥40, (2) subjects with So scores between 34 and 39, and (3) subjects with So scores ≤33. This leads to three new cells having 31, 37, and 32 subjects each.

Now, within each of these cells, the 18 scales of the CPI (or whatever variables one wishes to use in building the system) are correlated with the target variable. For the 31 subjects in the top cell, the scale correlating most highly with number of children wanted was responsibility (Re) ($r = -.25$). The 31 subjects were split, therefore, on Re, with 10 subjects having Re scores ≤32, and 21 with Re scores ≥33. There is an arbitrary judgment here that the top cells in the ultimate classificatory set should have smaller frequencies than middle or intermediate cells.

The middle cell of 37 subjects is next studied, and for these women the good impression (Gi) scale had the highest correlation (−.31) with number of children wanted. The 37 subjects were then split into 19 with GI ≤14, and 18 with Gi ≥15.

In the bottom cell of 32 subjects, the self-control (Sc) scale correlated most highly (−.32) with the target. Splitting the subjects into those with Sc ≤26 and ≥27 gave terminal cells of 20 and 12 subjects, respectively.

The growth of the tree and the decision rules adopted at each point

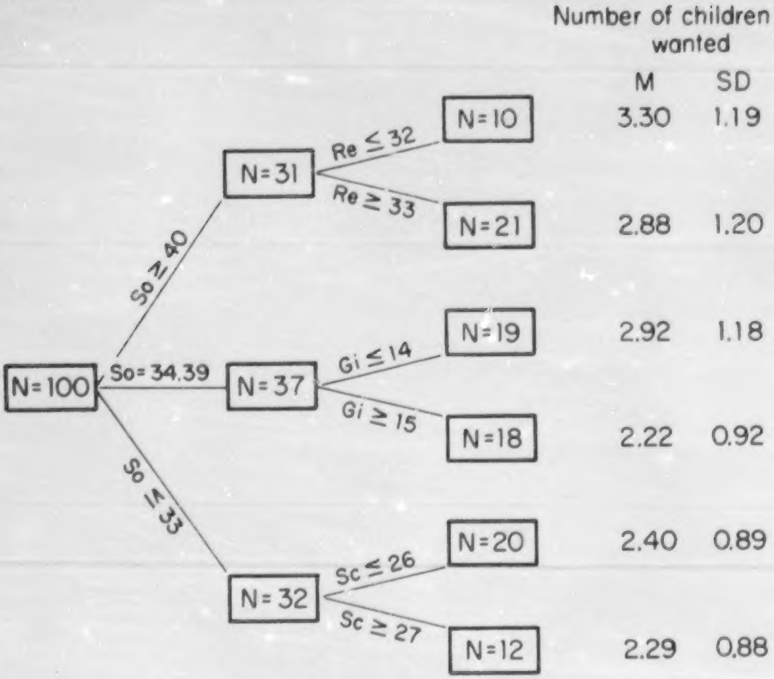
Number of children wanted
M
SD
N=100
So=34.39
So≥40
So≤33
N=31
N=37
N=32
Re≤32
Re≥33
Gi≤14
Gi≥15
Sc≤26
Sc≥27
N=10
N=21
N=19
N=18
N=20
N=12
3.30 1.19
2.88 1.20
2.92 1.18
2.22 0.92
2.40 0.89
2.29 0.88

FIGURE 1.—CPI decision tree for number of children wanted in a sample of 100 women.

of branching can now be graphed in figure 1, along with the means and standard deviations for number of children wanted for subjects in each end cell. It should be noted that this particular tree was stopped after six end cells were defined. The tree could have been continued on as long as coefficients could be reliably calculated and acceptable correlations obtained. Clearly, the greater the number of end cells, the more precise and pinpointed will be the prediction afforded by that tree. It should be equally clear that the longer this growth pattern is continued, the greater will be the strain on the inherent validity and reliability of the component variables, and the greater will be the need for cross-validation.

To obtain a predicted score for number of children wanted, the mean value for each end cell is assigned as a score to all subjects in that cell. Thus, for the 10 subjects in the top cell of the tree in figure 1, estimated or predicted values for number of children wanted were 3.30. For the 12 in the bottom cell, estimates of 2.29 were made. This six-score distribution can then be correlated with the target variable and the coefficient directly compared to that yielded by the regression equation. This was done for the sample of 100 women. The mean number of children wanted, as estimated, was 2.64 (SD = .36). Scores from the tree correlated .32 with the target variable and .70 with scores from the regression equation. The six-cell tree, therefore, makes forecasts that are quite similar to those of the regression equation, but slightly less accurate. Its only advantage, in this first problem, is that obtaining an estimated score for a new subject is somewhat easier and faster on the tree than on the equation, if the estimate is made by hand.

The third method to be explored is the typology. The three scales of the PVA lend themselves well to this kind of analysis, and cutting scores for dichotomous classifications on each scale have been given in the test manual. For women, these values for high–low splits are ≥20 on My, ≥25 on Sn, and ≥21 on Fy. Table 2 gives the number of subjects in each cell of the typology defined in this way and the mean number of children wanted.

TABLE 2.—*PVA typological analysis for number of children wanted in a sample of 100 women*

Type	N	M	SD
H-H-H	14	2.71	0.88
H-H-L	12	2.96	1.27
H-L-H	18	2.36	1.09
H-L-L	19	2.53	.75
L-H-H	14	2.96	1.26
L-H-L	5	3.30	1.78
L-L-H	10	2.10	1.04
L-L-L	8	2.67	.66

Note.—H = high, L = low. F = 1.09, df = 7, 92, *ns*.

The cell in table 2 with the highest mean number of children wanted by the wife is that for low modernity, high socialization, and low femininity, whereas the cell with the least number of children wanted is that for low modernity, low socialization, and high femininity. From the PVA manual[7] one can note that the low–high–low woman is frequently described as appreciative and conventional, but not insightful, and that women in the low–low–high cell are often viewed as reserved, narrow in interests, and lacking in spontaneity.

The F ratio for the eight means in table 2 is not significant. However, if each woman is assigned the mean value of her cell as a score, and then these 100 "scores" correlated with the actual number of children wanted, a coefficient of .28 is obtained, significant at the .01 level. This coefficient is lower than those of .36 and .32 obtained for the regression equation and decision tree, respectively. The typological scoring correlated .47 with scores from the regression equation and .48 with scores from the decision tree. For estimating number of children wanted in the sample of 100 women, one must conclude that the typology was less accurate and hence less informative than the other two methods.

The fourth method to be considered is termed "conjoint analysis," as it takes account of both husband and wife. Unfortunately for comparative purposes, we must now shift to the sample of 50 couples reported in table 1, as spouses were not tested for the 100 women and 78 men. There are various ways in which the scores of husband and wife can be combined into interaction grids and predictive indices. Inasmuch as the purposes of this report are exploratory, we will consider only simple, easily understood, and easily visualized combinations. One of these is the 2 by 2 table generated by dichotomizing husband's and wife's scores on either the same or different scales.

Jaccard[17] used this method to good effect in a study of number of children wanted by 58 college-age couples. Cutting the My scale distributions at the median for husbands and wives permitted designation of four types: husband high–wife high, husband high–wife low, husband low–wife high, and husband low–wife low. The mean number of children wanted by wives in each cell were 2.4, 2.8, 2.2, and 4.1. (*F*'s were significant beyond the .05 level.) The critical cell in Jaccard's analysis was low–low (both husband and wife low on modernity), in which wives wanted an average of 4.1 children. The other three interactions gave rise to distinctly lower mean values.

For the present sample of 50 couples, My scores were cut at 20 and above to give a high (H) classification and at 19 and below for a low (L) classification. The number of couples in each cell (N) and the mean number of children wanted by wives (M) were as follows: H–H, $N = 20$, $M = 2.0$; H–L, $N = 9$, $M = 2.4$; L–H, $N = 10$, $M = 2.6$; and L–L, $N = 11$, $M = 2.8$. The results are not as pronounced as those found by Jaccard, but the trend is the same in that the cell with the largest mean value is that in which both husband and wife rank low on modernity. The F ratio for this form-cell classification fell between the .05 and .10 levels of probability.

A second conjoint analysis of the 50 couples used the communality (Cm) and Fe scales from the CPI. Husbands were classified on Cm, with scores of 26 and above designated as high; wives were classified on Fe, with scores of 25 and above designated as high. Figure 2 shows the interaction diagram that these splits generated, and also provides N's, means, and standard deviations for the couples in each cell.

The interaction in figure 2 is rather impressive. Three of the cells gave rise to identical mean scores. In the fourth, in which husbands ranked lower on communality and wives higher on femininity, there is a significant increment in mean number of children wanted. The magnitude of this relationship can be expressed in correlational terms

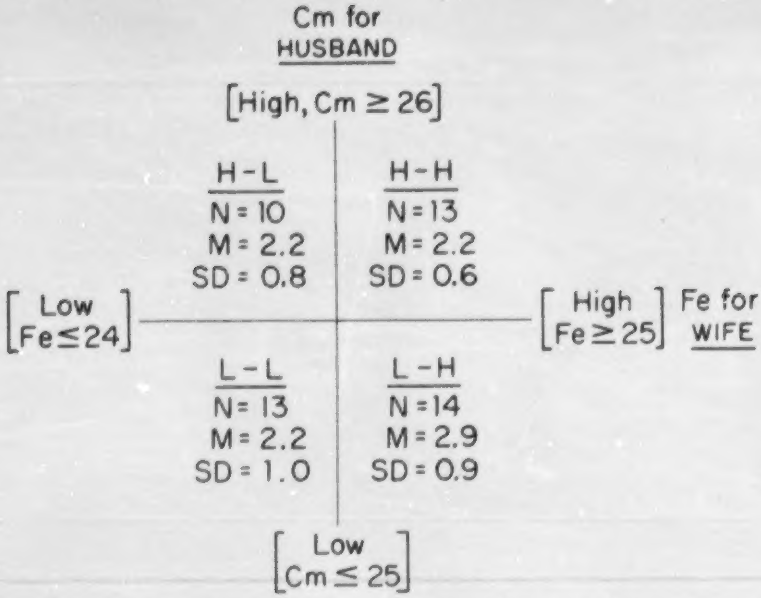

FIGURE 2.—Conjoint analysis on the CPI communality and femininity scales for number of children wanted by wife in a sample of 50 couples.

by assigning each woman the mean score for her cell and then correlating these 50 scores with the actual number of children wanted. The coefficient obtained by this procedure was .37, equivalent to the coefficient of .36 found above for the regression equation derived in the sample of 100 subjects.

NUMBER OF CHILDREN WANTED BY MEN

Let us now repeat the same series of analyses for number of children wanted in the sample of 78 males. It will be recalled from table 1 that the correlation between husband and wife on this variable was only .25. We can anticipate, therefore, results in the sample of 78 males different from those obtained in the sample of 100 females. The 28 test variables listed in table 1 were correlated with number of children wanted by men. Coefficients ranged from a low of −.36 for Cm to a high of .11 for self-acceptance (Sa). Rotter's LOC scale correlated .04, sexual knowledge −.23, and age −.01.

Regression analysis of the 18 scales in the CPI led to the following five-variable equation: 16.928 − .173Wb + .237To −.283Cm −.198Ai −.109Fe (where Wb is sense of well-being, To is tolerance, Cm is communality, Ai is achievement via independence, and Fe is femininty). The weights in the equation are for use with raw scores on the CPI. Vhen applied to the 78 CPI protocols, a set of scores was obtained that ad a mean of 2.87 ($SD = 1.07$) and a correlation of .54 with the actual umber of children wanted. Cross-validation on a new sample would e required before faith could be placed in the magnitude of this oefficient.

The intent of the analysis is heuristic, to show that clusters or ombinations of variables will surpass individual scales in predictive ccuracy and also to suggest what the patterning of predictors in the ersonality realm might be. In regard to pattern, it appears that men xpressing a desire for larger families tend to be less satisfied concerning their physical well-being, less conventional, less motivated to achieve in situations requiring independent appraisal and decision-making, but more masculine and more tolerant of persons different from themselves. As before, more and less in this context refers to men who express desires for a smaller number of children.

A decision tree was also constructed for the 78 males, beginning with the Cm scale. By splitting into a high group (Cm ≤ 25) and a low group (Cm ≥ 26), two intermediate cells of 35 and 45 subjects were evolved. Within each cell, the 18 scales were again correlated with the target variable. Among the 35 men in the higher cell, the Cm scale again had the strongest relationship ($r = -.46$). Splitting at 23 or below versus 24 or 25 on Cm led to two more intermediate cells of 18 and 17 men. Cm continued its strength as a forecaster for the 18 subjects, with a coefficient of $-.45$. For the 17 men, psychological-mindedness (Py) had the strongest relationship ($r = -.48$). Four end cells were defined, therefore, by 5 subjects with scores on Cm of 21 or below, 13 with Cm scores of 22 or 23, 7 with Py scores of 11 or less, and 10 with Py scores of 12 or above.

Returning in the tree to the 43 men in the lower branch, the highest correlation with the target was for So ($r = .36$). A split at 38 or above versus 37 or below generated new intermediate cells of 23 and 20. For the 23, the strongest correlation was once more with Cm ($r = -.36$). For the 20 men, social presence (Sp) had the highest coefficient ($r = .36$). Using these findings, four more end cells were defined: 7 men with Cm scores of 26, 16 with Cm scores of 27 or 28, 11 with scores of 38 or above on Sp, and 9 with Sp scores of 37 or below.

Figure 3 portrays this tree in completed form, with choice points and decision rules. Although seven decision points were defined and eight end cells attained, the tree made use of only four of the inventory's scales. The Cm scale was involved in four of the seven decision points, and therefore must be viewed as a very important component in the constellation of personality factors associated with number of children wanted by men in this sample. The lower the man's score on the Cm,

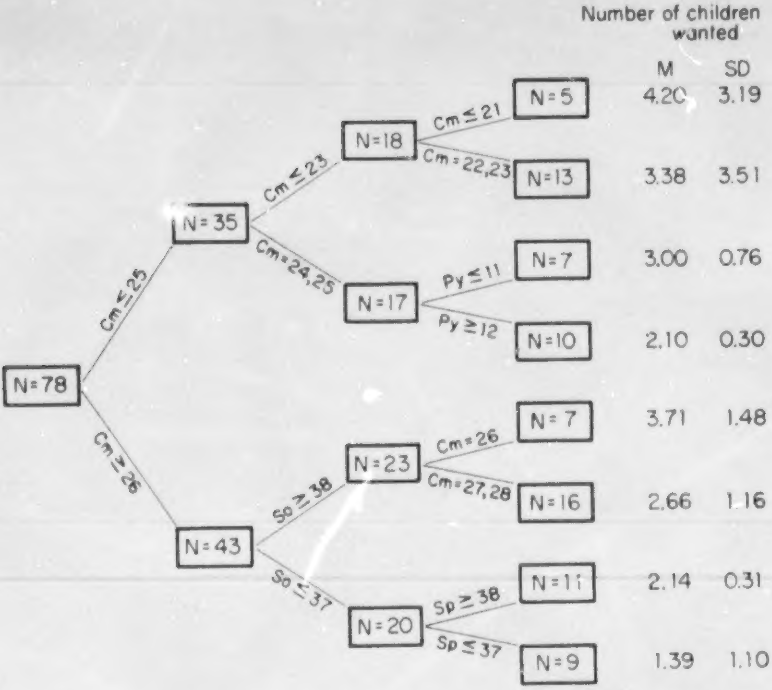
Number of children wanted
M
SD
N=78
Cm≤25
N=35
Cm≤23
N=18
Cm≤21
N=5
4.20
3.19
Cm=22,23
N=13
3.38
3.51
Cm=24,25
N=17
Py≤11
N=7
3.00
0.76
Py≥12
N=10
2.10
0.30
Cm≥26
N=43
Sp≥38
N=23
Cm=26
N=7
3.71
1.48
Cm=27,28
N=16
2.66
1.16
Sp≤37
N=20
Sp≥38
N=11
2.14
0.31
Sp≤37
N=9
1.39
1.10

FIGURE 3.—CPI decision tree for number of children wanted in a sample of 78 men.

the larger the number of children he states that he wants. The guide for clinical interpretation of the CPI[18] suggests that men scoring low on Cm will be more individual, less stereotypic, more likely to move in new and original directions, and more likely to be seen by others as careless, daring, pleasure seeking, and reckless.

Scores on the decision tree were derived by assigning to each man the mean value for his end cell. The 78 scores obtained in this way had a mean of 2.71 (*SD*=.78) and correlated .39 with the actual number of children wanted. The correlation of these scores with those from the regression equation was .40. The decision tree, therefore, was moderately similar to the equation in its forecasts for each man, but less accurate.

Table 3 gives data on number of children wanted for the eight-cell typology defined by high–low splits on the three scales of the PVA. Cutting points for high placement were ⩾20 on My, ⩾23 on Sn, and ⩾15 on Fy.

The *F* ratio for this typology was not significant, and the scores produced by giving each subject the mean value for his cell correlated

TABLE 3.—*PVA typological analysis for number of children wanted in a sample of 78 men*

Type	*N*	*M*	*SD*
H-H-H	24	2.60	1.37
H-H-L	12	2.58	1.12
H-L-H	16	2.66	2.02
H-L-L	6	4.17	4.98
L-H-H	4	3.00	1.22
L-H-L	7	2.43	.50
L-L-H	7	2.43	1.50
L-L-L	2	2.25	.25

Note.—H = high, L = low. $F = .51$, $df = 7, 70$, *ns.*

only .22 with the target variable. The mean for the set of 78 scores was 2.71 ($SD = .78$). Correlations with the scores from the regression equation were .17; from the decision tree, .08. The PVA typology, it can be concluded, was a very weak forecaster of number of children wanted in this sample and was not appreciably related to the other two methods of prediction.

Several conjoint analyses were tried on the sample of 50 couples. The best among those considered was one in which husbands were split into highs and lows on CPI femininity, and wives were dichotomized on the same scale. Cutting points for males were $Fe \geq 17$ = high group, $FE \leq 16$ = low, and for females the cuts were $Fe \geq 25$ = high, and $Fe \leq 24$ = low.

In the H–H category, there were 11 couples, in which husbands had a mean number of children wanted of 2.1. The H–L category had 16 couples, with husbands' mean score of 2.1. The L–H category had 14 couples, with husbands' mean being 2.5. The L–L category had only 9 couples, but the husbands had a mean criterion score of 4.3 (F over the four means = 3.13, $p \geq .05$). The 50 predicted scores obtained by assigning each subject the mean value for his cell had a mean of 2.59 ($SD = .83$) and a correlation of .41 with actual number of children wanted. This coefficient is not as high as that of .54 given by the regression equation in the sample of 78 males, but is still high enough to warrant attention. The key cell is that in which both husband and wife score in the more masculine direction on Fe.

Jaccard also considered the Fe/Fe interaction. Using number of children wanted by wife as a target, the key cell was husband low (more masculine) and wife high (more feminine); the mean here was 3.7, as compared with values of 2.3, 2.2, and 2.3 for the other three cells. For the present 50 couples, wife's number of children wanted was also highest in the L–H cell ($M = 2.6$), but not significantly higher than the means of 2.4, 2.2, and 2.4 in the other three cells. Two tentative inferences may be drawn from these three conjoint analyses on Fe: (1) a wife's number of children wanted will exceed the baseline for women in general if her Fe score is more feminine while that of her husband is more masculine, and (2) a husband's number of children wanted will exceed the baseline for men in general if his Fe score is more masculine and that of his wife is less feminine.

WOMEN'S PREFERENCE FOR THE PILL AND IUD AS CONTRACEPTIVE METHODS

The third target variable selected for study in this discussion is the acceptability to women of the pill and the IUD as contraceptive methods. A previous factor analysis of 10 contraceptive methods[11] had identified four groupings: (1) coitus dependent, (2) surgical, (3) coitus inhibiting, and (4) coitus independent. The fourth factor included two components: ratings of the pill and the IUD. These ratings were on a 5-step scale, with 5 signifying very acceptable, 4 indicating somewhat acceptable, and so on, down to 1, indicating very unacceptable. Factor 4 scores were computed by applying the weights .79 (pill) + .80 (IUD) to the 5-step ratings given by our 100 subjects. The mean factor 4 score for the 100 women was 7.72 (*SD* = 1.90).

These factor scores were correlated with the variables listed in table 1. On the CPI, coefficients ranged from −.29 for the achievement via conformance (Ac) scale to .11 for Sp. On the PVA the three coefficients were My = .14, Sn = −.16, and Fy = .03. Locus of control correlated .14, sexual knowledge .15, and age −.12. Number of children wanted had a coefficient of −.07, and number expected had a coefficient of −.07. The modest level of these relationships suggested that a search for clusters or combinations of predictors was justified.

A stepwise regression analysis of the 18 CPI scales, terminated after five iterations, defined the following equation: $9.236 + .066Cs + .028Sp - .085To - .115Ac + .092Py$ (where Cs is capacity for status, Sp is social presence, To is tolerance, Ac is achievement via conformance, and Py is psychological-mindedness). Weights on the equation are for use with raw scores on the inventory. When applied to the protocols of the 100 subjects, a set of scores was computed having a mean of 7.75 (*SD* = .70) and a correlation with the actual factor 4 scores of .37. A brief interpretive résumé of the equation suggests that women assigning higher acceptability ratings to the pill and IUD as contraceptive methods are surer of themselves in regard to social attainment, more skilled and at ease in everyday social encounters, less benign in judging others, diffident about achievement in explicitly structured tasks and settings, and given to intraceptive or psychological thinking about self and others.

A decision-tree analysis was then undertaken, with results obtained as illustrated in figure 4. The first choice point used the Ac scale

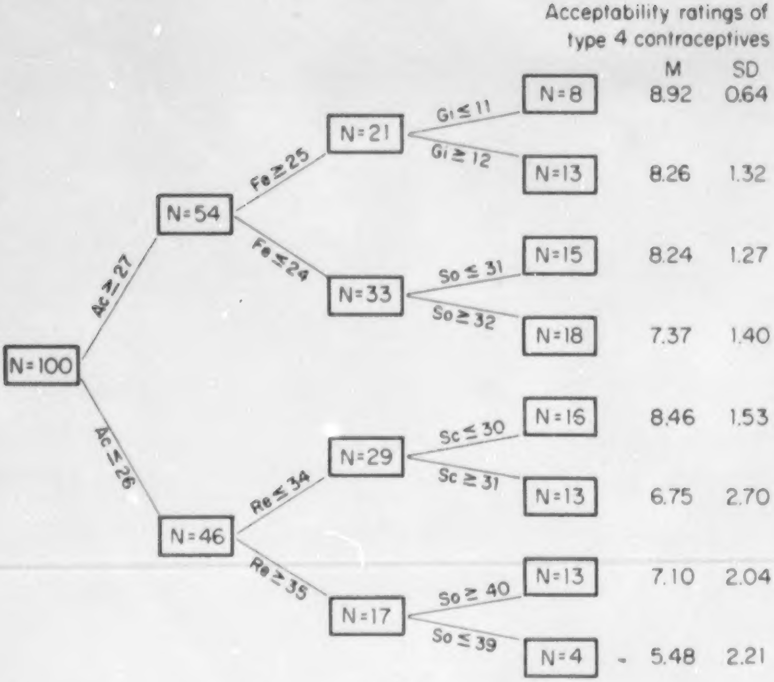
Acceptability ratings of type 4 contraceptives
M SD
N=100
Ac ≥ 27
Ac ≤ 26
N=54
N=46
Fe ≥ 25
Fe ≤ 24
Re ≤ 34
Re ≥ 35
N=21
N=33
N=29
N=17
Gi ≤ 11
Gi ≥ 12
So ≤ 31
So ≥ 32
Sc ≤ 30
Sc ≥ 31
So ≥ 40
So ≤ 39
N=8 8.92 0.64
N=13 8.26 1.32
N=15 8.24 1.27
N=18 7.37 1.40
N=16 8.46 1.53
N=13 6.75 2.70
N=13 7.10 2.04
N=4 5.48 2.21

FIGURE 4.—CPI decision tree for acceptability of type 4 contraceptives (IUD and pill) in a sample of 100 women.

for splitting the total sample into part samples of 54 and 46. In the upper branch, first Fe and then Gi and So were used for subsequent splits, leaving four end cells containing 8, 13, 15, and 18 subjects, respectively. Along the lower branch, the Re scale was first used to differentiate among the 46 subjects, followed by Sc and So. Again, four end cells were defined having 16, 13, 13, and 4 subjects, respectively. The decision to stop at eight end cells, it should be repeated, is an arbitrary one; the larger cells could have been split again, permitting the tree to grow to 11, 12, or even more end points. Statistical constraints must be observed, of course. If no correlation of target and predictors is significant at or beyond a specified level of probability (such as $p \leq .05$), there is no reason to permit the tree to grow beyond the end cell in which the insignificant coefficients have been computed.

As before, scores on the tree were derived by assigning each woman the mean factor 4 value for her end cell. This set of 100 scores had a mean of 7.72 (*SD* = .82) and correlated .44 with the actual factor scores. The scores from the tree also corre-

TABLE 4.—*PVA typological analysis for acceptability of type 4 contraceptives (pill and IUD) in a sample of 100 women*

Type	*N*	*M*	*SD*
H-H-H	14	7.10	1.93
H-H-L	12	7.79	1.69
H-L-H	18	8.52	1.64
H-L-L	19	7.76	1.41
L-H-H	14	7.27	2.65
L-H-L	5	7.46	1.65
L-L-H	10	7.74	1.98
L-L-L	8	7.78	1.37

Note.—H = high, L = low. F = .78, df = 7, 92, *ns*.

lated .41 with those from the regression equation. Whereas the decision trees for number of children wanted by women and by men were slightly less accurate forecasters than the regression equations, the tree to predict ratings of the pill and IUD is slightly more accurate than the corresponding regression equation. Subjects in the top cell (n = 8) of the tree have a lower drive for conventional achievement, above-average femininity, and relatively little interest in creating a conventionally favorable impression. At the other end of the tree (n = 4) are subjects with a strong drive for traditional attainment, a firm sense of responsibility, but with only average or less than average internalization of rule and restraint. These inferences from the CPI scales are speculative and should be viewed as merely tentative hypotheses awaiting study by other methods. For example, it would be very interesting to interview subjects selected from each of the eight end cells and then determine the extent to which interviewers' checklists, ratings, and narrative accounts would reveal significant variations among the eight clusters.

Table 4 presents factor 4 means and standard deviations for subjects in each of the eight cells defined by the PVA typological analysis. Lowest acceptability was voiced by subjects in the high–high–high cell, highest by those ranking high on modernity and femininity, but low on socialization. Because the F ratio over the eight means was not significant, interpretation of these differences is not warranted. Scores derived from the typological analysis (by assigning the mean value from each cell to subjects in that cell) yielded a mean of 7.72 (SD = .45), and correlations of .24 with the actual factor 4 scores, .46 with scores from the regression analysis, and .18 with those from the decision tree.

The fourth analysis against factor 4 contraceptive preferences appealed to conjoint examination of scores for husbands and wives in the sample of 50 couples. Sixteen such probes were carried out, using scales from the CPI, PVA, and in addition LOC and SKQ scores. No interactions significant even at the .10 level were discovered. This contrast between the abundant yield of significant conjoint effects for number of children wanted by either husband or wife and the failure to find any interactions for contraceptive preference raises an interesting question: might it be that choice among contraceptive methods is a peripheral or trivial matter in the marital dyad, something not much affected by the nature of the relationship between spouses? One should not expect every aspect and facet of sexual behavior and child seeking to be interactionally rooted, and the acceptability of various contraceptive techniques may be one element whose determinants are primarily individual.

These speculations can be pursued further by asking about consistency in use of a contraceptive method, whatever the reasons for its selection. For example, acceptability of the pill or IUD may not be an interactional matter, but wife's consistency in using the pill might rest on the dynamics of the marital relationship. From the 39 couples studied by Rodgers and Ziegler,[19] 15 were identified as consistent users of the pill and 9 as inconsistent or erratic users (the remainder were classified in a "pregnancy" or "miscellaneous" group). An analysis of PVA scores for these 24 couples[20] revealed that inconsistent use tended to occur more often among couples where both spouses were low on modernity, high on socialization, and discrepant on femininity (wife low, husband high). An index based on these directionalities correctly classified 18 of the 24 couples as consistent or inconsistent users, a hit rate of 75 percent. The subsamples of 9 and 15 are far too small to permit generalization of the specific index and cutting points, but the finding that an interactional metric could be related to contraceptive behavior is worth notice. Systematic accumulation of a large body of conjoint analyses would help to distinguish between family-planning behaviors having primarily individual or interactional determinants.

VASECTOMY

The last target variable to be considered in this discussion is vasectomy. In the sample of 50 couples, there were 16 in which the husband had been vasectomized and 34 in which other forms of contraception were employed. The Rodgers and Ziegler[19] couples were divided into 38 with vasectomies and 35 without. The combined sample, therefore, included 54 couples with vasectomies and 69 without.

Three kinds of analysis were undertaken on these 123 couples: (1) regressions on husbands' PVA scores, (2) regressions on wives' PVA scores, and (3) conjoint analyses including regressions and contingency tables. For the 123 husbands, point-biserial correlations between vasectomy and the scales of the PVA were −.07 for My, +.15 for

Sn, and +.07 for Fy. The three-scale regression equation for husbands alone correlated .18 with the criterion.

For wives, point-biserial correlations between PVA and the 0–1 coding of husbands' status on vasectomy were −.08 for My, −.17 for Sn, and −.16 for Fy. The three-scale regression equation correlated .24 with the target variable. This is an interesting finding, in that a slightly more accurate forecast of husband's vasectomy can be made from his wife's inventory scores than from his own.

Most of the published psychological research on vasectomy has dealt with its effects on postoperative sexual drive, adjustment, and marital stability. Less has been written on psychological determinants of vasectomy, in spite of the fact that its use is rapidly increasing. Westoff,[21] for example, found that 7.8 percent of the couples in his national fertility sample reported vasectomy of the husband and went on to estimate that as of 1970 approximately 2.75 million couples of reproductive age had resorted to either vasectomy or tubal ligation. Wolfers and Wolfers[22] used the term "vasectomania" and commented (unfavorably) on the upwards of 7 million vasectomies performed in India in exchange for cash payments and on what they characterized as the naïve enthusiasm of American advocates. In a prior paper, Helen Wolfers[23] reviewed psychiatric opinion designating vasectomy as "a means for emotionally sick women to castrate their husbands" and as "a pawn in a sub rosa bargaining procedure." Although these somewhat dramatic statements need not be taken at full value, they do suggest that the choice of vasectomy is not always an outcome of matter-of-fact and rational decisionmaking. Research on both individual and conjoint determinants of vasectomy is clearly needed.

In the sample of 50 couples, each spouse was interviewed concerning personal history, psychosexual development, and marital harmony. At the end of the interview, the interviewer recorded his reactions by means of the Block[24] 100-item California *Q* Deck. Husbands were seen by a male interviewer and wives by a female. The *Q*-sort descriptions of the 16 husbands with vasectomies were contrasted with those of the other 34 by means of a *t* test; only two items discriminated significantly at the .05 level, suggesting that nothing of consequence differentiated the interview behavior of the two subsamples. However, when the *Q* descriptions of wives were contrasted, eight items differentiated the 16 wives whose husbands had been vasectomized from the other 34, and two additional items had *t* ratios between 1.96 and 2.00, just short of the .05 level for 48 degrees of freedom.

In view of psychiatric opinion that wives of vasectomized husbands often have punitive and aggressive impulses toward their spouses, the 10 *Q* items just mentioned are worth citing. Let us give first the items sorted by the interviewer as more characteristic of the 16 wives whose husbands had been vasectomized:

1. Has a rapid personal tempo; behaves and acts quickly ($t = 2.25, p \leq .05$).
2. Responds to humor ($t = 3.45, p \leq .01$).
3. Behaves in an ethically consistent manner; is consistent with own personal standards ($t = 2.10, p \leq .05$).
4. Is physically attractive; good looking ($t = 2.01, p \leq .05$).
5. Is personally charming ($t = 1.96, p \leq .10$).

The five descriptions sorted as more characteristic of the 34 wives whose husbands had not been vasectomized were as follows:

1. Anxiety and tension find outlet in bodily symptoms ($t = -1.98, p \leq .10$).
2. Engages in personal fantasy and daydreams, fictional speculations ($t = -2.13, p \leq .05$).
3. Judges self and others in conventional terms like "popularity," "the correct thing to do," social pressures, etc. ($t = -2.05, p \leq .05$).
4. Handles anxiety and conflicts by, in effect, refusing to recognize their presence; repressive or dissociative tendencies ($t = -2.10, p \leq .05$).
5. Interprets basically simple and clear-cut situations in complicated and particularized ways ($t = -2.45, p \leq .05$).

Neither cluster is ominous, psychiatrically speaking, but the advantage in adjustment and social presence seems to lie with the 16 wives whose husbands had been vasectomized. One can assert that in this sample, at least, these wives were not obviously characterized by vindictive, hostile, or exploitative impulses.

The regression analyses of the PVA scores of husband alone or wife alone, it will be recalled, did not furnish very much in the way of forecasting the criterion. Greater precision of estimation must be sought in the conjoint patterning of scores. Table 5 gives point-biserial correlations between the target variable and nine possible forecasters: husband's My, Sn, and Fy; wife's My, Sn, and Fy; and three conjoint scorings, husband's My plus wife's My, husband's Sn minus wife's Sn, and husband's Fy minus wife's Fy. These sums and differences take account of the direction of correlation for husband and wife alone.

Two regression analyses using scores from both husband and wife were carried out, with the following results:

$$V = 10.783 + .229(\mathrm{H, Sn}) - .258(\mathrm{W, Sn}) - .232(\mathrm{W, Fy}) \qquad (1)$$

$$V = 8.851 - .071(\mathrm{H, My} + \mathrm{W, My}) + .233(\mathrm{H, Sn} - \mathrm{W, Sn}) + .170(\mathrm{H, Fy} - \mathrm{W, Fy}) \qquad (2)$$

where H is husband and W is wife.

b

TABLE 5.—*Correlations among PVA scales and combinations and vasectomy of husbands in a sample of 123 couples*

Variable	Variable									*M*	*SD*
	H, Sn	H, Fy	W, My	W, Sn	W, Fy	My + My	Sn − Sn	Fy − Fy	Vasectomy		
H, My	.06	.03	.34	.09	−.05	.80	−.03	.05	−.07	19.35	4.31
H, Sn		.12	−.02	.13	.00	.02	.67	.08	.15	22.52	3.69
H, Fy			.21	.04	−.14	.15	.06	.72	.07	14.24	2.86
W, My				.06	−.10	.84	−.06	.20	−.08	18.03	4.72
W, Sn					.05	.09	−.65	−.01	−.17	24.78	3.61
W, Fy						−.09	−.04	−.78	−.16	22.20	3.16
H, My + W, My							−.05	.16	−.09	37.38	7.39
H, Sn − W, Sn								.07	.24	−2.26	4.81
H, Fy − W, Fy									.15	−7.96	4.54
Vasectomy[1]										.44	.50

Note.—H = husband, W = wife.

[1] Vasectomy = 1, no vasectomy = 0.

Equation 1, when applied to the PVA scores of the husbands and wives, gave rise to a mean of 4.39 ($SD = 1.41$) and a point-biserial correlation of .28 with the criterion. Equation 2, when similarly applied, gave rise to a mean of 4.32 ($SD = 1.48$) and a point-biserial coefficient of .30. Scores on the two equations correlated .89 with each other.

Scores on the two equations can also be used to classify couples with regard to vasectomy. On equation 1, 54 couples had computed scores of 4.60 or above. Of these, 31 were from the vasectomy subsample. Of the 69 couples with scores of 4.59 or below, 46 in fact were from the nonvasectomy subsample. This interaction is significant well beyond the .01 level, and the hit ratio of couples correctly classified is 77/123 or 62.6 percent.

On equation 2, 54 couples had scores of 4.56 or above, and of these, 29 came from the vasectomy subsample. Sixty-nine couples had scores of 4.55 or below, and of these, 44 were from the nonvasectomy subsample. This interaction is also significant beyond the .01 level, but the hit ratio is a bit less, 73/123 or 59.4 percent.

Conjoint high–low analyses were also conducted. The best one pitted husbands with high (≥ 23) or low (≤ 22) Sn scores against wives scoring high (≥ 23) or low (≤ 22) on Fy. Table 6 gives the relationship between the four interactions and the vasectomy versus nonvasectomy criterion.

TABLE 6.—*Conjoint analysis categories for husbands scoring high or low on PVA socialization and wives high or low on PVA femininity in a sample of 123 couples*

Type	Non-vasectomy	Vasectomy	Percent vasectomy
H-H	18	9	33.3
H-L	11	19	63.3
L-H	19	11	36.7
L-L	21	15	41.7
Total	69	54	

Note.—H = high, L = low.

One cell deviates from the base rate for the total sample of 123 couples—that in which husband scores high on PVA socialization and wife low on PVA femininity. If the high–low category is used to forecast vasectomy, 19 of the 30 couples would be correctly identified; if the other three categories are used to forecast nonvasectomy, 58 of the 93 couples in these three cells would be correctly identified. The hit rate is thus 77/123 or 62.6 percent. However, the conjoint table is not as effective as the three-scale regression just discussed, as it seriously underestimates the number of couples in the vasectomy subsample;

that is, it places only 30 couples into this subsample whereas the true number is 54.

The dynamic interplay implied by the critical high–low quadrant is that between a husband who is attentive to duties and obligations, schooled in doing what he should, and responsive to the needs and wishes of others and a wife who is decisive, initiating, and more independent than her higher scoring sisters. It is hard to avoid the inference that the wife plays a very significant role in her husband's decision to be vasectomized. There are three reasons in the above data for making this inference: (1) the criterion outcome can be better predicted from wife's scores alone than from husband's alone; (2) the conjoint equation with the best hit rate carries two variables from the wife, one from the husband; and (3) the strongest conjoint interaction implies a marital relationship in which initiative lies more with the wife than the husband.

SUMMARY AND DISCUSSION

Up to the present time, psychological analyses of factors that might predict fertility or other criteria in the field of population have been more or less discouraging. Yields in the classic Indianapolis and Princeton studies were scanty, nor have more recent inquiries been conspicuously more successful. What appears to be needed is vigorous pursuit of new possibilities, both instrumental and methodological. Specifically, multivariate broadband assessment tools should be employed, so that more promising loci of measurement can be differentiated from less promising. In the methodological realm, studies should depart from the hoary one-variable-at-a-time model and should seek clusters and combinations that capitalize on the dynamic interplay among predictive elements.

Exploratory work of the kind being advocated should be progressive with respect to tools and methods, but conservative with respect to criteria. That is, researchers should concentrate on familiar and important outcomes in the family-planning domain so that new findings can be linked to prior work and so that the relevance of the new studies will be self-evident.

The analytic probes reported in this paper have sought to heed both of these admonitions. Multivariate test batteries dealing with positive, everyday variables of personality and temperament were employed, and for criteria, such obvious and tangible issues as number of children wanted, acceptance of the pill and IUD as contraceptive methods, and vasectomy were targeted for forecast. In regard to methodologies, regression algorithms were liberally used and lesser known and less often tried techniques such as the decision tree and typological analysis were brought into the picture. An attempt was also made to look at conjoint interactions between husband and wife, in recognition of the (often overlooked) truism that family-planning behaviors typically involve two people.

The results obtained in these analyses suggest that the regression equation is a difficult method to surpass. Even though it is linear and additive, imposing the same weights and combinations of variables on all persons, its predictive or classificatory accuracy is not easily exceeded. It should also be noted that the individual terms in a regression equation need not be limited to single test scores or independent variables. Sums, differences, and products of two or more variables can be entered into the original set of components, and if these complex elements will enhance the precision of the equation, the algorithm will seek them out and weight them appropriately. An example of this kind of analysis was presented for choice of vasectomy as a contraceptive method. Husband's score on modernity was added to that of wife to give one such element, and two difference scores were also considered: husband's socialization minus wife's and husband's femininity score minus wife's. The regression equation derived from these three variables thus paid attention to conjoint phenomena as well as to combinations of scale scores.

Three applications of decision-tree methodology were presented, to forecast number of children wanted by women and by men and to identify women giving higher acceptability ratings to the pill and IUD. In a decision tree, each branching point entails a decision rule that is usually linear, but the total set of such choices can be highly interactive. That is, the scale or index to be used to sharpen the forecast of outcome for any particular person will depend on what prior scores were used to bring her or him to the point in the tree at which the new projection is to be made. To the writer's knowledge, decision-tree techniques have not previously been applied to problems of prediction in the population realm. Two of the three trees presented in this paper were less effective than the corresponding regression equation in forecasting criteria, but one—that to identify women favoring the pill and IUD—was more accurate.

Once a decision tree has been constructed, it is a very simple and reliable device to apply to a new case. Scores from the new protocol are quickly scanned and the decision rules applied until the subject is properly located in the appropriate end cell. The forecast for that individual is then the mean score for a continuous variable, or preponderant outcome for a discontinuous one. All three of the examples in this paper dealt with continuous criteria, but the method is in no way confined to such indices. If, for example, dichotomous criteria are at issue, such as choosing or rejecting vasectomy, variables being reviewed for a decision rule at each choice point can be evaluated by means of the *t* test; the test or scale having the largest *t* ratio can then be selected as a classifier.

The third technique of analysis considered was the typology. The eight-cell system generated by high–low splits on the modernity, socialization, and femininity scales of the PVA was applied to three criteria; in each instance, the eight-cell typology was inferior to the regression equation and decision tree as a predictor. This finding should not dampen one's enthusiasm for the typological method (see below), nor for the three scales of the inventory: that is, the method can produce very strong findings if appropriate type-generating variables are employed, and the modernity, socialization, and femininity scales gave rise to very heuristic findings when analyzed in other circumstances.

The conjoint analyses of scores from husband and wife considered simultaneously may have produced the most instructive new data. Attention is called to the fact that conjoint analysis does not stand in opposition to the other three methods reviewed above: regressions, decision trees, and typologies may all be derived from conjoint data pools. This paper gave one illustration of a conjoint analysis using regression methodology: choice of vasectomy by 54 couples in a sample of 123. Three examples were given of typological analysis based on conjoint data: number of children wanted by wife in a sample of 50 couples, number wanted by husband in this same sample, and choice of vasectomy as a contraceptive method in a sample of 123 husbands and wives. A decision tree based on conjoint data was not constructed, but easily could have been.

Comments to this point have avoided explicit citation of the magnitude of correlation achieved in any specific analysis. The reason for this is that all of the predictive or classificatory indices derived above await cross-validation and confirmation or disproof by subsequent study. An attempt was made to use samples large enough to generate robust results, but cross-validation remains a necessity before specific indices are proposed for application elsewhere.

A final observation may be made. Sheer prediction, in which variables combine in uninterpretable and confusing ways, would be of little interest even if the level of accuracy were high. One wants an analysis to shed light on the dynamic processes at work and on elements that can be modified if change is deemed necessary or desirable. Although quantified scales and measures were employed and processed by means of statistical computations, the emergent indices were not mere sets of numbers. Indeed, most of them were rich in interpretive implications and permitted the setting forth of a large number of hypotheses that investigators preferring other modes of study might find worthy of consideration.

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Chapter 8

Multiple-Regression and Facet Techniques in Psychological Research on Population[a]

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The two methodological techniques presented in this paper—the measurement technique of facet analysis and the statistical method of multiple regression—are related only in that we have found both to be very useful in studies conducted in the general area of family planning at the Wayne State University College of Nursing Center for Health Research. The data I will use to illustrate these techniques are mainly drawn from two of these studies. Both of these studies have been described previously;[1-6] therefore, only an outline follows.

NATIONAL SURVEY OF PROFESSIONALS

In this study we were interested in family-planning attitudes and knowledge of students and faculty in schools of nursing, medicine, and social work. The five main areas covered in the survey were the following:

1. Attitudes toward family planning and related topics, including

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population, birth control, abortion, sterilization, and family size
2. Views on appropriateness of professional roles in family planning
3. Views on adequacy of preparation for these roles
4. Knowledge about family planning and sexuality
5. Knowledge about contraceptive effectiveness

Stratified random samples of schools within the three professions were drawn and included 47 nursing schools, 11 medical schools, and 15 social work schools. All students and teaching faculty in these schools were surveyed. Sample sizes were 6,333 nursing students and 712 nursing faculty, 2,347 medical students and 1,198 medical faculty, and 1,958 social work students and 349 social work faculty. Response rates ranged from 42 percent for medical faculty to 84 percent for nursing faculty.

In this study the facet approach was used to generate the items pertaining to appropriateness of professional roles in delivery of family-planning services.

NURSES' ABORTION ATTITUDES STUDY

The purpose of this study was to explore in some detail the attitudes of nurses on several aspects of abortion. Included in the questionnaire were sections on abortion attitudes, perceived roles of different professionals in delivery of abortion services, and perceived adequacy of training for participation in abortion care.

The four groups constituting the sample were (1) a random sample of 557 registered nurses from New York State; (2) a comparable random sample of 435 Michigan registered nurses; (3) an agency sample of 370 registered and licensed practical nurses from Metropolitan New York City, most of whom were working in hospital obstetrical-gynecological services or in clinics; and (4) a similar sample of 507 registered and licensed practical nurses working in hospitals in Metropolitan Detroit. The data were collected just prior to the Supreme Court abortion ruling. At that time, abortions were legal in New York but not in Michigan.

The two facet items from this study to be discussed were the circumstances under which abortion was viewed as appropriate and the views on who should participate in the abortion decision.

THE FACET METHOD OF ITEM CONSTRUCTION

RATIONALE

One of the basic problems in attitude measurement is that attitudes are often complex. Responses to attitude statements consequently tend to depend on assumptions the respondent makes about circumstances and contingencies not explicitly spelled out in the attitude question itself. For example, if we were to ask someone whether they were in favor of abortion, most would probably respond "Well, it depends." The same reaction would be likely for such questions as "What is the ideal number of children for an average couple?" or "Should health professionals play a role in delivery of family-planning services?"

The facet method of item construction first proposed by Guttman[7] represents one approach to the evaluation of the effect of such factors on attitude judgments. The rationale involved is essentially the same as that of a factorial design in analysis of variance. Guttman used the terms "facet" and "facet levels" to refer to what are called factors and factor levels in analysis of variance. The facet method of item construction consists essentially of presenting the basic attitude statement to the subject under all possible facet level combinations. Consequently, we are able to assess the effects on response of the facet interactions as well as the effects of the facets themselves.

EXAMPLES

Example 1: Appropriateness of professional roles in family-planning services (from the National Survey of Professionals). One of the questions we were interested in as part of the National Survey of Professionals concerned the views of health professionals on the roles they thought were appropriate for the various health professions in the delivery of family-planning services. If we were to ask each respondent the question, "Do you think that health professions should have a role in delivery of family-planning services?" most of them would probably have said Yes, but think to themselves that the question really didn't make much sense. What services? Which professional? What kind of client? Who initiates the service? That is to say, a more meaningful answer would depend on contingencies not spelled out in the question as asked.

Type of professional, level of service, type of client, and locus of initiation, therefore, became the facets in the item designed to tap views on professional roles. The facet levels were the following:

TABLE 1.—*Percentages of appropriate responses for facet combinations*

Facet levels	Physician						Nurse						Social worker					
	Married woman		Unmarried woman 18 or over		Unmarried woman under 18		Married woman		Unmarried woman 18 or over		Unmarried woman under 18		Married woman		Unmarried woman 18 or over		Unmarried woman under 18	
	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F
Client requests																		
General information:																		
SW	99	98	99	99	99	97	98	99	98	98	95	96	98	100	98	99	97	98
M	99	99	99	98	98	95	96	96	95	94	88	84	95	89	94	87	87	77
N	98	97	97	96	95	95	95	97	92	93	84	88	92	93	90	90	82	85
Specific information:																		
SW	99	99	99	99	98	98	84	90	84	87	[illegible]	82	63	64	70	65	67	63
M	100	99	99	98	97	92	73	81	72	78	63	65	55	47	56	46	49	41
N	99	99	97	96	90	91	69	82	65	76	53	66	50	43	49	42	41	37
Help obtain contraceptives:																		
SW	97	99	96	97	91	89	88	96	86	95	74	78	86	92	83	89	72	77
M	98	96	97	93	91	84	72	82	68	76	53	56	71	75	67	68	52	51
N	97	97	90	91	76	81	57	77	49	63	34	44	55	68	46	55	32	38
Demonstration of devices:																		
SW	98	99	97	98	94	92	85	91	84	89	76	79	35	27	36	27	33	28
M	98	97	97	95	94	87	84	88	80	82	66	63	42	32	42	31	35	26
N	95	97	92	93	82	85	70	84	61	73	45	55	32	26	30	25	24	21

Professional initiates																		
General information:																		
SW	98	96	97	96	97	95	93	95	93	94	93	92	96	96	96	96	95	94
M	98	97	97	96	96	93	87	89	86	86	83	80	90	84	88	82	84	76
N	97	97	96	95	95	94	92	92	90	89	85	87	89	88	88	86	83	84
Specific information:																		
SW	91	87	90	86	92	88	74	73	73	74	74	74	63	55	62	57	63	58
M	93	93	92	91	91	88	63	71	61	66	58	59	51	44	49	42	46	39
N	94	91	92	87	89	89	66	71	61	63	54	60	51	42	47	37	42	35
Help obtain contraceptives:																		
SW	82	81	81	79	84	78	69	76	67	73	67	69	67	71	65	68	65	67
M	85	88	83	84	82	78	57	69	53	65	47	53	56	60	53	57	47	46
N	89	87	83	80	75	80	51	63	42	52	33	42	45	54	39	45	31	37
Demonstration of devices:																		
SW	84	80	82	81	86	81	67	71	66	70	68	67	31	24	30	23	31	24
M	87	88	85	85	85	80	63	69	60	65	56	54	36	28	35	27	32	23
N	90	88	85	82	80	83	59	66	53	56	45	51	31	26	28	22	24	19

Note.—S = students; F = faculty; SW = social worker (students = 1,704; faculty = 274); M = medical (students = 2,110; faculty = 945); N = nursing (students = 5,387; faculty = 560).

TABLE 2.—*Average percentages of appropriate responses for each level of the four facets for the six groups*

Facet	NS	NF	MS	MF	SWS	SWF	Mean of group percentages[1]
Professional:							
Physician	90	90	91	91	93	91	91
Nurse	63	70	70	74	81	84	74
Social worker	51	50	60	53	67	65	58
Client:							
Married woman	73	76	77	78	81	82	78
Unmarried woman 18 or over	69	70	74	75	80	81	75
Unmarried woman under 18	61	64	70	66	79	78	70
Level of service:							
General information	91	91	92	89	97	97	93
Specific information	67	67	70	69	80	78	72
Help obtain contraceptives	57	64	68	71	79	82	71
Demonstration of devices	57	58	64	62	66	64	62
Initiation:							
Client requests	69	73	78	76	85	85	78
Professional initiates	66	67	70	69	76	75	71
Mean percentage of all items	68	70	74	73	80	80	74

[1] The means of the group percentages are unweighted, that is, not weighted by sample size.

Note.—NS = nursing students (N = 5,387); NF = nursing faculty (N = 560); MS = medical students (N = 2,110); MF = medical faculty (N = 945); SWS = social work students (N = 1,704); SWF = social work faculty (N = 274).

1. Three types of professional—physician, nurse, and social worker
2. Four levels of service—general discussion, specific discussion, help in obtaining contraceptives, and demonstration of devices
3. Three types of client—married woman, unmarried woman 18 or over, and unmarried woman under 18
4. Two sources of initiation—the professional and the client

Thus, the facet design generated 3 × 4 × 3 × 2 = 72 separate items.

The specific results are reported elsewhere.[2,6] Briefly, the results indicate that every facet made a difference, as was expected. The reader can get a general idea of the overall effects found by looking at the patterns in table 1. The main effects of the facets themselves are summarized in table 2. Note that the facets level in table 1 have been ordered so that the proportions of those agreeing that the service is appropriate tend to decrease from left to right and from top to bottom within facets.

TABLE 3.—*Analysis of variance for facet items*

Source of variance	*SS*	*df*	*MS*	*F*	*p*
A (between professions)	.9007	2	.4504	61.5	.05
Subjects (*Ss*) (within professions)	.0220	3	.0073		
B (type of profession)	8.1554	2	4.0727	174.4	.05
B × A	.3204	4	.0801	3.4	
B × *Ss* (error)	.1403	6	.0234		
C (type of client)	.4841	2	.2421	79.7	.05
C × A	.0936	4	.0234	7.7	05
C × *Ss* (error)	.0182	6	.0030		
D (level of service)	5.6191	3	1.8730	262.5	.05
D × A	.2784	6	.0464	6.5	.05
D × *Ss* (error)	.0642	9	.0071		
E (origin of initiation)	.5588	1	.5588	141.8	.05
E × A	.0466	2	.0233	5.9	
E × *Ss* (error)	.0118	3	.0039		
B × C	.0672	4	.0168	8.5	.05
B × C × A	.0218	8	.0027	1.4	
B × C × *Ss* (error)	.0236	12	.0020		
B × D	2.9976	6	.4996	84.6	.05
B × D × A	.2658	12	.0221	3.8	.05
B × D × *Ss* (error)	.1063	18	.0059		
B × E	.0285	2	.0142	8.6	.05
B × E × A	.0112	4	.0028	1.7	
B × E × *Ss* (error)	.0990	6	.0017		
C × D	.0966	6	.0159	52.1	.05
C × D × A	.0133	12	.0011	3.6	.05
C × D × *Ss* (error)	.0055	18	.0003		
C × E	.0531	2	.0027	156.5	.05
C × E × A	.0011	4	.0003	1.6	
C × E × *Ss* (error)	.0010	6	.0002		
D × E	.0883	3	.0294	90.8	.05
D × E × A	.0156	6	.0026	8.0	05
D × E × *Ss* (error)	.0029	9	.0003		
C × D × E	.0155	6	.0026	16.5	.05
C × D × E × A	.0040	12	.0003	2.1	
C × D × E × *Ss* (error)	.0028	18	.0002		
B × D × E	.0262	6	.0044	2.8	.05
B × D × E × A	.0223	12	.0019	1.2	
B × D × E × *Ss*[1] (error)	.0282	18	.0016		

[1] The remaining interaction terms were small and nonsignificant and have been omitted.

In order to check on possible interaction effects, we did an analysis of variance (ANOVA) of the facet data. The size of the data set, 72 observations on each of more than 12,000 subjects, exceeded the capacity of the computer programs available to us. Therefore, in order to reduce complexity and size of the analysis, the mean for students and the mean for faculty within each profession were treated as if they

TABLE 4.—*Summary tables of interaction breakdowns for facet items*

A by C

	c_1	c_2	c_3
a_1	82	81	78
a_2	77	74	68
a_3	75	70	63

A by D

	d_1	d_2	d_3	d_4
a_1	97	79	80	65
a_2	91	70	70	63
a_3	91	67	60	58

B by C

	c_1	c_2	c_3
b_1	94	91	89
b_2	79	75	67
b_3	61	59	53

B by D

	d_1	d_2	d_3	d_4
b_1	97	94	87	87
b_2	91	71	64	68
b_3	90	51	60	30

C by D

	d_1	d_2	d_3	d_4
c_1	95	74	76	66
c_2	93	72	72	62
c_3	90	69	63	57

B by E

	e_1	e_2
b_1	94	88
b_2	78	69
b_3	61	55

C by E

	e_1	e_2
c_1	82	73
c_2	79	71
c_3	72	68

E by D

	d_1	d_2	d_3	d_4
e_1	94	75	76	66
e_2	91	68	65	58

Note.—The facets and facet levels are the following: A = professional groups (a_1 = social work, a_2 = medicine, a_3 = nursing); B = types of professional (b_1 = physician, b_2 = nurse, b_3 = social worker); C = type of client (c_1 = married woman, c_2 = unmarried woman 18 or over, c_3 = unmarried woman under 18); D = level of service (d_1 = general discussion, d_2 = specific discussion, d_3 = help in obtaining contraceptives, d_4 = demonstration of devices); E = origin of initiation (e_1 = client initiates, e_2 = professional initiates). Entries represent average percentage for each cell.

were single observations. The reduced design, therefore, was a five-factor mixed design with professions as the between-subjects factor ($n = 2$) and the facets as the four within-subjects factors. A partial ANOVA table for this analysis is given as table 3 and subtables summarizing the two-way interactions are found in table 4.

The major purpose of the ANOVA was to locate the major effects in terms of their sum of squares; we were not particularly interested in statistical significance per se. Indeed, had the analysis been done using subjects rather than subgroups as the unit of analysis, almost all effects would have been statistically significant because of the large sample sizes.

Because these data have been discussed elsewhere, I will only comment that while all the two-way interactions were significant, and most of them sizable as well, all but one of the three-way interactions and all of the higher order interactions were negligible. The implications for item construction of presence of interactions in facet data will be discussed subsequently.

Example 2: Appropriateness of abortion as a function of certain circumstances (from the Nurses' Abortion Attitudes Study). In this case, we were interested in factors affecting nurses' judgments of when abortion is appropriate. The facets were the following:

1. Reason for abortion or original pregnancy
2. The trimester of pregnancy
3. Age of the woman
4. Marital status of the woman

The six levels (see table 5) for the reasons facet were the following:

1. To preserve mother's health
2. Fetus defective
3. Pregnancy result of rape
4. Pregnancy result of incest
5. The child was not wanted
6. The pregnancy resulted from not using contraceptives

(The last two levels are not particularly good choices as they overlap each other and the other four.) The first, second, and third trimester constituted the levels of the trimester of pregnancy facet. The age of client facet had two levels: (1) under 18 and (2) 18 and over. The two levels of marital status were married and unmarried. The four groups of nurses who answered this question were described previously.

Table 5 presents the proportions of nurse respondents from the four groups who agreed that abortion was appropriate under various combinations of circumstances. Again facet levels have been ordered so that proportions tend to decrease from left to right and from top to bottom. Even without an ANOVA, one can see in a general way how the facets and their combinations affect response. All main effects made a difference except age of client. (It is interesting to note that age did make a difference in the previous example.) Interactions include the following: for the first trimester of pregnancy, responses to the first four levels ("hard" reasons) of the reasons facet are quite different from the last two ("soft" reasons). As we move to the second trimester, the reasons begin to divide into three groups; this trend is even more pronounced by the third trimester. Thus we see that for these four groups of subjects, the *hard reasons versus soft reasons* dichotomy that some have made holds for the first trimester, but seems to be viewed as a trichotomy after this period. This effect would show up in the ANOVA as a reasons by trimester interaction.

It is interesting to compare the effects of age and marital status as they relate to appropriateness of abortion (table 5) with the effects of these facets on appropriateness of professionals giving family-planning services to these clients (tables 1–4). It would seem that health professionals view unmarried women as somewhat more appropriate recipients of abortions than married women, but less appropriate clients for family-planning services.

Table 5.—*Percentages of appropriate responses for facet combinations*

The reason for the abortion is—	First trimester				Second trimester				Third trimester			
	Under 18		Over 18		Under 18		Over 18		Under 18		Over 18	
	U	M	U	M	U	M	U	M	U	M	U	M
New York random (*N* = 424):												
To preserve the mother's health	87	85	87	86	74	74	75	74	58	58	59	59
Evidence shows a defective fetus	81	80	80	79	73	70	72	71	58	57	57	57
The pregnancy resulted from rape	85	83	84	82	65	62	63	61	35	35	35	36
The pregnancy resulted from incest	84	80	82	80	64	62	63	60	37	37	36	35
The child is not wanted	66	60	64	60	45	40	45	39	20	19	18	16
The pregnancy resulted from not using contraceptives	62	49	58	52	39	29	37	30	13	10	12	09
New York hospital (*N* = 237):												
To preserve the mother's health	92	90	93	92	79	77	81	80	59	59	64	63
Evidence shows a defective fetus	91	90	90	89	84	81	81	80	65	64	63	62
The pregnancy resulted from rape	94	91	92	88	70	66	70	67	38	35	36	35
The pregnancy resulted from incest	87	83	85	81	68	66	64	63	38	38	37	37
The child is not wanted	68	62	65	60	46	41	45	39	17	15	15	12
The pregnancy resulted from not using contraceptives	60	45	58	47	34	25	33	27	08	06	09	06
Michigan random (*N* = 340):												
To preserve the mother's health	86	84	85	85	71	69	70	69	58	57	59	59
Evidence shows a defective fetus	74	73	74	74	64	63	62	62	50	48	49	48
The pregnancy resulted from rape	81	78	81	76	53	48	51	47	32	29	32	29
The pregnancy resulted from incest	80	77	78	75	54	51	53	50	34	33	35	33
The child is not wanted	48	43	48	45	29	23	26	22	15	11	14	11
The pregnancy resulted from not using contraceptives	43	30	41	33	21	12	21	13	07	04	10	05
Michigan hospital (*N* = 387):												
To preserve the mother's health	84	82	86	85	64	63	65	64	47	47	49	48
Evidence shows a defective fetus	73	73	74	73	61	60	60	58	43	44	43	42
The pregnancy resulted from rape	77	73	75	73	47	45	44	42	27	26	26	24
The pregnancy resulted from incest	73	70	72	70	48	46	46	44	30	28	28	27
The child is not wanted	42	35	39	34	21	17	19	15	10	07	08	07
The pregnancy resulted from not using contraceptives	37	27	36	29	13	08	13	09	05	04	05	03

TABLE 6.—*Percentages of appropriate responses for facet combinations*

The right to make the decision to have an abortion should belong to the—	Under 16		16-18 years		18 and
	U	M	U	M	U
New York random:					
Pregnant woman if she is	54	67	71	72	86
Mother and father of the unborn child if the pregnant woman is	36	67	46	71	55
Mother and father of the pregnant woman if she is	45	10	24	5	5
Personal physician of the pregnant woman if she is	24	18	18	14	14
Hospital committee for approving abortions if the pregnant woman is	19	12	15	11	10
Member of the clergy if the pregnant woman is	6	4	5	3	4
New York hospital:					
Pregnant woman if she is	52	69	75	73	86
Mother and father of the unborn child if the pregnant woman is	32	72	50	73	57
Mother and father of the pregnant woman if she is	43	10	23	7	7
Personal physician of the pregnant woman if she is	27	21	21	18	18
Hospital committee for approving abortions if the pregnant woman is	19	14	14	12	13
Member of the clergy if the pregnant woman is	6	4	4	3	4
Michigan random:					
Pregnant woman if she is	37	45	51	49	69
Mother and father of the unborn child if the pregnant woman is	20	52	27	56	35
Mother and father of the pregnant woman if she is	42	6	26	3	3
Personal physician of the pregnant woman if she is	33	27	28	24	24
Hospital committee for approving abortions if the pregnant woman is	31	25	25	21	20
Member of the clergy if the pregnant woman is	8	6	6	5	5
Michigan hospital:					
Pregnant woman if she is	29	47	48	52	65
Mother and father of the unborn child if the pregnant woman is	23	52	31	57	44
Mother and father of the pregnant woman if she is	46	8	26	5	6
Personal physician of the pregnant woman if she is	36	27	30	23	24
Hospital committee for approving abortions if the pregnant woman is	40	34	35	29	29
Member of the clergy if the pregnant woman is	7	5	5	4	4

Note.—Only subjects who answered all items are included. Box heads are a continuation of left-hand column. U = unmarried; M = ma

Example 3: Views on appropriate participants in the abortion decision (from the Nurses' Abortion Attitudes Study). In this item, we were interested in the question of who should participate in the abortion decision. The facets and their levels were (1) six possible participants in the abortion decision, (2) three age categories for the woman, and (3) married versus unmarried clients. The basic data for the four groups for this facet item are given in table 6. In this example, unlike the previous two, interactions rather than main effects account for most of the variability. Given the nature of these facets, this was not unexpected.

DISCUSSION OF FACET TECHNIQUES

The present analysis of facet data differs from that of Guttman and others who have extended and applied this approach. The main difference is that the latter have been interested mainly in certain scaling properties of the facets. By analyzing patterns of intercorrelations among the facet combinations, one can, in theory, determine whether the data are consistent with certain structural models, such as simplex, circumplex, radex, and a number of others. Our aim in using the facet approach is more modest in a sense; namely, we wanted simply to assess the effects of the facets and facet combinations on *level* of response. Consequently, we have confined our analyses to the differences in means among facet combinations using an ANOVA approach.

An investigator of course might want to do both types of analysis. In our case, however, we have used only dichotomous responses; as the resulting phi coefficients representing the interitem correlations are affected by the marginal splits, a Guttman-type analysis would be difficult to do.

In my opinion, the main advantage of the facet approach is the evaluation of facet interactions. Presence of interactions means that we will obtain misleading information whenever we ask our attitude questions in the usual way, that is, without specifying the relevant contingencies or circumstances. The higher the order of the nonnegligible interactions, the more detailed the specifications of the circumstances should be. Looking at the problem from another point of view, absence of interactions, at least of those of higher order, could be thought of as a desirable outcome, in the sense that accurate information about respondents' attitude structure can be obtained more simply. Information about presence or absence of interactions can only be obtained with items generated by the facet method or one similar.

Knowledge about attitude structures is often of practical interest. For example, it might be very useful to be able to determine for a particular sample of individuals the subset of facet combinations for which there was majority endorsement. In fact, this structure, in effect, is what legislators must often determine when they put together a legislative package and have some assurance of its passage.

There is, of course, the one disadvantage of the facet approach—that is the often large number of items generated with the attendant problems of subject time and patience. My own interest in pursuing research with the facet method is to devise ways of reducing the number of facet items necessary without losing essential information. Use of block designs and Latin-square designs to generate the facet items seems to me to offer distinct possibilities along this line. Critical to this approach, however, is the absence of higher order interactions.

Whether or not one actually uses facet items in their research, I highly recommend the exercise of constructing such items. This in itself will tell a lot about the attitude structures of interest even before any data are collected.

APPLICATION OF MULTIPLE-REGRESSION ANALYSIS IN FAMILY-PLANNING RESEARCH

In this section, I will discuss ways in which we have found multiple-regression analysis useful in our family-planning research. Indeed, in the first two examples to be discussed, our initial interpretation of the data was substantially altered by a subsequent multiple-regression analysis.

Examples

Example 1: Analysis of group differences in family-planning attitudes (from the National Survey of Professionals). In the National Survey of Professionals, we found that there were sizable and consistent differences among the three professional groups on all of the family-planning items and scales. Social work respondents tended to be most liberal, medical respondents next, and nursing respondents were relatively conservative. Students and faculty within each profession were similar.

Given these results, the natural inclination of the investigator is to explain these differences in attitude in terms of differences among the professions in such aspects as differential training, professional role expectations, and the like. Indeed, this is what Werley et al.[7] did. Of course, we were aware of the fact that these three professions differed substantially on a number of background variables which were in turn related to family-planning and related attitudes. The group differences in attitude might be simply reflecting group differences in such background characteristics as religion, race, sex, and socioeconomic status. The question was the extent to which the group differences in attitude were a function of the background variables.

To assess relative contribution of group membership versus background variables to prediction of attitudes, we did a stepwise multiple regression. The group membership variable was represented by five dummy codes representing the five degrees of freedom for between groups.[8] The set of background variables was forced into the equation first, then the group membership dummy variables. The results for several of the attitude variables are given in table 7.

What is remarkable about these results is that after the background variables (particularly religious affiliations and frequency of church attendance) were entered into the multiple-regression equation, the additional variance accounted for by group membership was practically zero. In other words, the differences found among the professional groups apparently had little to do with professional training and socialization per se, but rather reflected differential self-selection on background variables, which themselves were related to family-planning attitudes.

Example 2: Analysis of differences between "good drops" and "bad drops" (from a family-planning program).[9] In this study, we looked at some of the contraceptive consequences for those clients who had dropped out of a Planned Parenthood program. We distinguished between good drops and bad drops in terms of whether they were using effective birth control (or did not need it)—the good drops—or whether they were using ineffective methods—the bad drops. We found a number of background and questionnaire variables on which these groups differed, but these variables were themselves related. Again the question arose as to which variables were the critical ones in the prediction.

Using a stepwise multiple-regression analysis, we found that the variable that best distinguished the groups was the scale we called Fear of the Pill, which was constructed from the questionnaire responses (see table 8). It is not known whether Fear of the Pill led to dropout for the bad drop group or whether this served as a rationalization for doing so. Also, the demographic variables of education and race were related to both dropout groups and to Fear of the Pill. The point is that the multiple-regression analysis did give a clearer picture of the differences between the two groups than would be obtained from looking at the group differences on the individual variables singly, as is so often done.

Example 3: Multiple-regression analysis in assessment of usefulness of psychological tests in family-planning research. The final application of multiple-regression analysis I will comment on is its use as a basis for what I feel is the appropriate criterion for evaluation of the

TABLE 7.—*Multiple-regression analysis of group differences on family-planning scales*

Criterion scale	Predictors	Multiple correlation (*R*)	Simple *r*
Professional role	Frequency of church attendance	.281	−.28
	Religious affiliation	.291	.15
	Cumulative *R*—background variables	.301	—
	Medical versus social work	.319	.08
	Cumulative *R*—all variables	.335	—
	Frequency of church attendance	.335	.33
Ideal number of children/ average American family	Number of siblings	.384	.25
	Religious affiliation	.404	−.24
	Race	.414	.11
	Cumulative *R*—background variables	.424	—
	Nurses versus medical and social work	.436	.26
	Cumulative *R*—all variables	.439	—
Total family-planning attitude	Frequency of church attendance	.492	−.49
	Religious affiliation	.535	.34
	Number of siblings	.545	−.22
	Cumulative *R*—background variables	.559	—
	Students versus faculty by nurses versus other interaction	.569	−.27
	Cumulative *R*—all variables	.573	—
Selected attitude subscales:			
Abortion	Frequency of church attendance	.531	−.53
	Religious affiliation	.603	.42
	Cumulative *R*—background variables	.625	—
	Cumulative *R*—all variables	.630	—
Sterilization	Frequency of church attendance	.285	−.29
	Religious affiliation	.335	.25
	Cumulative *R*—background variables	.352	—
	Cumulative *R*—all variables	.353	—
Population growth	Frequency of church attendance	.377	−.38
	Religious affiliation	.410	.26
	Race	.428	−.11
	Cumulative *R*—background variables	.449	—
	Cumulative *R*—all variables	.460	—
Birth control—general	Frequency of church attendance	.445	−.45
	Religious affiliation	.460	.23
	Cumulative *R*—background variables	.475	—
	Cumulative *R*—all variables	.483	—

Note.—Only subjects with data on all predictors and criterion are included; $N = 7{,}794$.

TABLE 8.—*Stepwise multiple regression for the good drop versus the bad drop groups*

Predictor	Multiple correlation	Simple r
Fear of pill	.376	−.38
Length of time woman used birth control prior to enrollment	.424	.16

Note.—Variables that added a nonsignificant increment to the multiple correlation included educational level, race, income, number of preschool children, and two variables based on ratings of adequacy of various aspects of the clinic services. Good drops were coded 1 and bad drops, 0.

usefulness of psychological tests in predicting family-planning variables. For example, suppose we are interested in using psychological tests to predict which women will become successful contraceptors. The Rotter Internal–External (I–E) scale certainly has considerable face validity for this problem, so we include the I–E scale in our study. Suppose we find, then, that there is a significant difference in the expected direction between effective and ineffective contraceptors. We conclude that our theory was correct and that the test does have potential as a predictor.

I would submit that simply showing that the psychological test and the family-planning criterion correlate (even if the correlation is sizable) is not enough. What I feel we have to show is that the psychological test has incremental validity. In other words, we should be able to show that the test accounts for criterion variance beyond that already accounted for by background and demographic variables, as this information is usually collected routinely from patients. Again multiple-regression analysis would be employed; the background variables would be put in first, then the psychological tests.

In a recent study of psychological correlates of obesity performed at Wayne State University, several tests were found that correlated with the obese–normal dichotomy. However, when background variables like "Was your mother obese?" were put in the multiple-regression equation first, the incremental contribution of the psychological tests dropped to almost nothing.

In this discussion I do not mean to imply that I feel that psychological tests are useless in the area of family planning. What I am saying is that they must prove themselves according to a more rigorous and, I feel, more realistic standard.

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Chapter 9

Measurement and Analysis of Family-Composition Preferences[a]

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With increasing use of birth control measures, preference may soon become the predominant determinant of family size, and the number of children desired should be a relevant motivational factor in predicting actual family size, spacing of children, and perhaps the tendency to adopt. However, any attempt to measure family size must contend with the confounding effect of sex composition. This factor may influence the stated preference for family size and may depress its validity in predicting the size of the completed family. For example, a woman who tells an interviewer that she would like four children may actually be thinking of a specific composition (say three boys and one girl). Since it is unlikely that the desired composition will be achieved (in this case, the probability is .75 that it will not) and since the only available alternative for correcting an unwanted composition is more children, the composition preference will reduce the accuracy of a prediction derived from size preference only.

Thus, it is important to develop measures of family-size preference unbiased by sex preference; for this, a model of family-composition preference decisions is necessary. The development of unfolding theory[1] and conjoint measurement[2] provides the basis for a model suitable for individual as well as aggregate data. An advantage of these techniques is that they use only ordinal data. Unfolding theory

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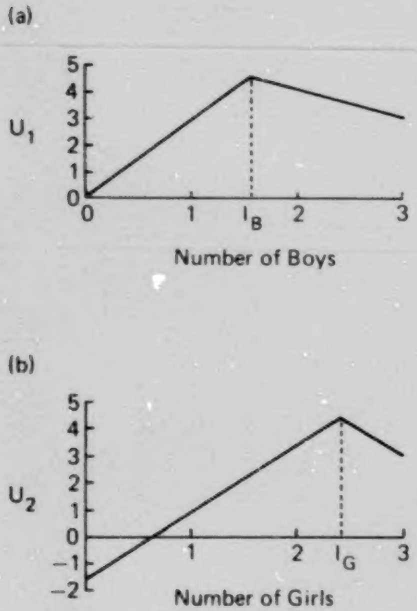
[a] This paper was presented at the symposium entitled "Theoretical and Methodological Approaches to the Study of Population Issues" held at the annual meeting of the American Psychological Association, New Orleans, Sept. 1974.



(c)

	u(G)	−1.6	.9	3.4	3.0
u(B)		0	1	2	3
0	0	-1.6	.9	3.4	3.0
2.9	1	1.3	3.8	6.3	5.9
4.1	2	2.5	5.0	7.5	7.1
3.0	3	1.4	3.9	6.4	6.0

(d)

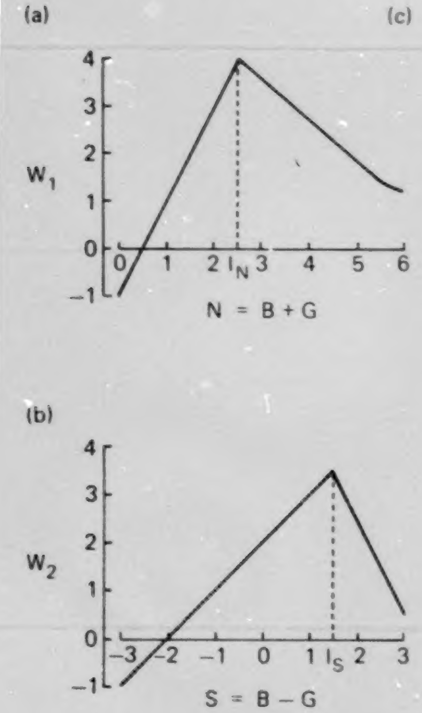
	G	0	1	2	3
B	0	16	15	10	11
	1	14	9	4	6
	2	12	7	1	2
	3	13	8	3	5

FIGURE 1.—Model 1.

posits that for any dimension of choice, each individual has a single-peaked utility function over that dimension, with the peak at the individual's ideal point. A preference order is viewed as the dimension of choice folded at the individual's ideal point. Several such preference orders (I scales) can be unfolded (see Coombs[1]) to yield the underlying dimension. Additive conjoint measurement tests whether the joint effect of compound stimuli can be represented as the sum of the separate effects of the stimulus components. These measurement techniques, which are models in themselves, lead naturally to the two models of family-composition preference that were tested in this study.

MODEL 1

This model asserts that an individual has single-peaked preference functions over the number of boys (B) and over the number of girls (G) that assign numerical values, called utilities, to each level of B and G, and that these utilities add up to provide a utility for the combination. A hypothetical instance is illustrated in figure 1. The utility functions are shown in parts a and b, their sum for each level of



(c)

$W_1(N)$		−1	1	3	3.6	2.7	1.9	1.3
$W_2(S)$		0	1	2	3	4	5	6
−1	−3				2.6			
0	−2			3		2.7		
1	−1		2		4.6		2.9	
2	0	1		5		4.7		3.3
3	1		4		6.6		4.9	
2.5	2			5.5		5.2		
0.5	3				4.1			

(d)

	0	1	2	3	4	5	6
−3				14			
−2			11		13		
−1		15		7		12	
0	16		4		6		10
1		9		1		5	
2			2		3		
3				8			

FIGURE 2.—Model 2.

B and G used in this study is in matrix c, and the rank order of the sums (1 = highest) is in matrix d.

MODEL 2

This model asserts that an individual has a single-peaked preference function over each variable's total family size (N; N = B + G) and the algebraic difference between the number of boys and the number of girls (S; S = B − G), which assign numerical utilities to each level of N and S, and that these utilities add up to provide a utility for the combination. A hypothetical instance is illustrated in figure 2.

The three basic ordinal tests of these models follow; the tests are hierarchical in the sense that a later test cannot be satisfied if an earlier test has been violated.

1. Single peakedness is satisfied if in every row and every column of a rank-order matrix, the preference monotonically increases to

a peak and then decreases. If single peakedness is satisfied, a unique and meaningful index for each variable can be constructed for each fixed level of the other variable. Such an index not only reflects the first choice but the entire structure for the other choices as well.

2. The row variable is independent of the column variable if and only if the ordering induced on the rows by a fixed level of the column variable is independent of the level fixed. Similarly, the column variable is independent of the row variable if and only if the orderings on the column variable induced by the row variable are the same for each level of the row variable. Independence insures that the indices constructed for single peakedness then do not depend on the level at which the other variable is fixed.

3. Additivity is satisfied if it is possible to construct a numerical additive representation that duplicates the rank-order preference matrix. While it is possible to specify exact conditions under which the rank-order preference matrix will satisfy additivity, the testing of additivity is more efficiently performed by using a computerized algorithm[3] for constructing a representation. Additivity insures that two variables do not inherently interact. That is, the variables are psychologically independent, and measures constructed for them are not confounded with one another.

METHOD

STUDY 1

A total of 423 students (17 percent married, 56.6 percent female) in introductory psychology and sociology classes at the University of Michigan were given a deck of 16 IBM cards to rank order in preference. Each card presented one family composition (*x* boys, *y* girls) from the set of 16 constructed by forming all combinations of 0, 1, 2, or 3 boys and 0, 1, 2, or 3 girls.

STUDY 2

As part of a pretest for a broad fertility study in Taiwan, the same 16 IBM cards were presented to a probability sample of 200 Taiwanese women; cartoon figures were used to indicate the number of boys and girls for each choice.

RESULTS AND DISCUSSION

Tests of single peakedness for both models are presented in table 1. For model 1, 31.2 percent of the respondents violate single peakedness for B, 33.5 percent for G. For model 2, only 5.2 percent violate single peakedness for N, 13.7 percent for S. (Figures given are for study 1

TABLE 1.—*Tests of single peakedness*

Model	Number of violations										
	N	Percent	*N*	Percent	*N*	Percent	*N*	Percent	*N*	Percent	Total
Model 1:											
B	291	68.8	98	23.2	30	7.1	4	0.9	0		423
G	273	64.5	103	24.3	37	8.7	8	1.9	2	0.5	423
Model 2:											
N	401	94.8	18	4.3	4	0.9	0		0		423
S	365	86.3	56	13.2	2	0.5	0		0		423

Note.—*N* indicates number of respondents.

unless otherwise noted; those for study 2 are entirely similar with respect to testing the models.) Thus, indices have been constructed only for N and S.

The index for N is constructed with S fixed at zero, and the index for S with N = 3, since in the present design these levels give the finest discrimination. There are four levels of N (0, 2, 4, and 6) when S = 0, and the ordering on those values of N determines the index, as illustrated in figure 3. The midpoints between stimuii on the dimension determine seven intervals; each ordering on N corresponds uniquely to one of these intervals. The corresponding label (IN1 to IN7 in the figure) is the index for the variable N. Respondents with IN3's thus have ideal points within the third interval, IN2's within the second, and so on. A similar procedure is followed for the four levels of S (−3, −1, 1, 3) with N = 3, yielding IS1 to IS7. A high IN indicates a large family size bias and a high IS indicates a strong boy bias. Usable size bias indices were constructed for 97.6 percent of the respondents and usable sex bias indices for 87.7 percent. For 3.6 percent, S is an inessential variable (i.e., it had no effect on preference and thus represents the true absence of a sex bias, as distinct from a preference for S = 0, which is a sex bias for an evenly balanced family).

Table 2 gives the distribution of IN and IS indices by sex and study. There is no significant difference between University of Michigan men and women on size bias. Most men and most women have a boy bias, but there is a significant difference between them in that more women have a girl bias. The differences between the Michigan undergraduates and the Taiwanese women are enormous, with the Taiwanese women preferring large families with a strong boy bias.

Independence is satisfied for less than 2 percent of the respondents when the data are fit into model 1, so this model can clearly be rejected as a viable psychological model for family composition preferences. For model 2, N is independent of S for 60.0 percent, S is independent of N for 35.7 percent. However, the ordinal tests of independence are quite stringent and allow for no experimental error. To allow for such error, a respondent is judged to have made only random errors if pair reversal

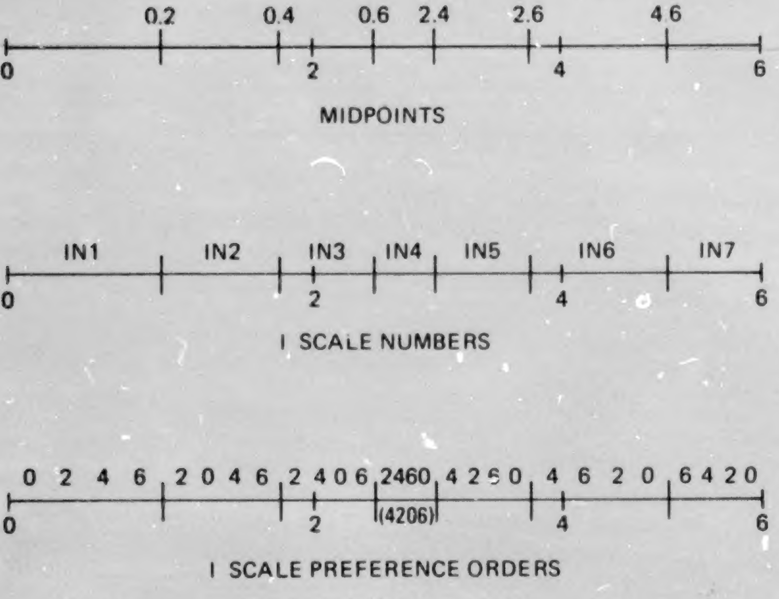

0.2
0.4
0.6
2.4
2.6
4 6
0
2
4
6
MIDPOINTS
IN1
IN2
IN3
IN4
IN5
IN6
IN7
0
2
4
6
I SCALE NUMBERS
0 2 4 6
2 0 4 6
2 4 0 6
2460
4 2 6 0
4 6 2 0
6 4 2 0
(4206)
0
2
4
6
I SCALE PREFERENCE ORDERS

FIGURE 3.—Model 2—size bias.

of two or less adjacent rank orders eliminates the violations of independence. Under such a definition of random error, N is independent of S for 85.4 percent of the respondents, S is independent of N for 70.1 percent, while there is virtually no change in the percent satisfying independence for model 1. Thus, even though there is strong support for model 2 over model 1, model 2 is not completely adequate. That is, for some respondents, N and S do inherently interact. For those respondents who do not satisfy independence, the N and S indices are dependent on the level at which the other variable is fixed, but this is usually of little consequence since selecting another level for the fixed

TABLE 2.—*Percentage distribution for IN and IS*

Subjects	IN			IS		
	1–3	4	5–7	1–3	4	5–7
University of Michigan men	42.6	35.4	22.0	16.1	23.9	60.0
University of Michigan women	34.9	37.9	27.2	26.2	17.5	56.3
University of Michigan total	38.1	37.0	24.7	21.7	20.0	58.3
Taiwan women	0.0	35.8	64.2	1.1	8.4	91.5

variable changes the IN or IS indices by at most one and has little effect on the data reported in table 2.

Additivity in model 2 is satisfied by virtually all of the 60.8 percent who satisfy both types of independence (N with respect to S and S with respect to N) under the random error criterion. Thus, for the majority of the respondents, N and S are psychologically independent and their IN and IS measures are completely unconfounded measures of preference for total family size and family composition, respectively.

While this study shows that model 2 is an appropriate attitude model for family-composition preference and provides measures for the relevant variables N and S, it does not provide the validation of predicting actual fertility behavior that only a longitudinal study can provide. Such a study using only IN indices has been reported by Coombs.[4] Even though the IN indices used were confounded with sex preference, IN level was a better predictor than first choice alone. The reason for this superiority is that an IN index incorporates not only the first choice for total family size but also all other choices as well. For example, in figure 3, IN2, IN3, and IN4 all have a first choice of two children, but IN2 prefers none to four children, whereas IN4 prefers having six children to none. Clearly, the potential for a large family is greater for an IN4 than for an IN2.

Combined use of both IN and IS should further increase the accuracy of predictions of fertility. Consider the rank-order preference matrix of table 3, which is represented in sequential fashion in figure 4. Arrows in the figure pointing up represent boys; arrows pointing down, girls. Plain arrows lead to more preferred choices for this respondent; dotted arrows to less preferred. All the arrows in the columns "1st child" and "2d child" are plain; this respondent will have at least two children. For the "4th child" column, all arrows are dotted: he will have at most three children. However, the remaining column includes both dotted and plain arrows, and the decision of whether to have a third child will depend on the relative strengths of the sex and size biases unless the immediately preceding composition is one boy, one girl. Of course, such a sequential analysis has its dangers, the most important being that the preference structure could change over time, but that is no less a problem for any other measure of expected fertility.

This study provides a solid theoretical and empirical basis for the indices IN and IS as measures of family-size preference and family-sex-composition preference, respectively. Because they are mutually uncontaminated measures of attitudinal disposition, IN and IS can usefully serve as dependent variables in the study of factors affecting attitudes and as independent variables affecting fertility.

A more detailed description of this method for obtaining family preferences and a more complete analysis of the data are available elsewhere.[5, 6]

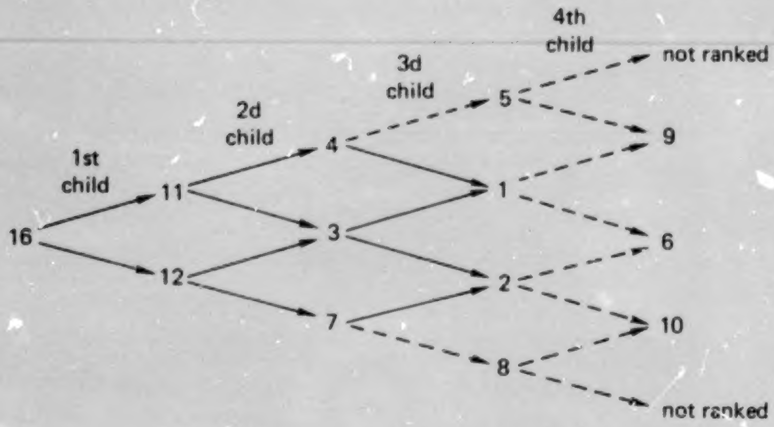


FIGURE 4.—Sequential preference analysis of table 3.

TABLE 3.—*An illustrative rank-order preference matrix*

R	G			
	0	1	2	3
0	16	12	7	8
1	11	3	2	10
2	4	1	6	14
3	5	9	13	15

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Chapter 10

Birth-Planning Values and Decisions: Preliminary Findings[a]

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For the most part, investigations of childbearing have been of a demographic nature.[1-5] While this research has revealed the geographical and sociological determinants of childbearing, it tells us little about the factors that influence individual couples as they consider whether to have a (another) child. Demographic data are but gross summaries of the results of multitudes of such couples' birth-planning decisions. It is time, therefore, to look more closely at these decisions.

Attempts to discuss birth planning as a purposeful and structured decision process often meet with derision—"Children aren't planned, they just happen." This cynicism is belied by the fact that contraception is used to control the timing and number of pregnancies.[6]

Little information exists, however, about the factors that individual couples ponder when making the decision to have a child. Information about these factors is basic to influencing birth decisions, both to implement health or social policy and to aid couples in making the decision that will be most personally satisfying to them. This paper describes the development and initial findings of a project aimed at providing knowledge about the process and determinants of birth-planning decisions.

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BASIC ASSUMPTIONS

The first assumption underlying the present research is that at least part of what appears to be irrationality in birth-planning decisions results from the fact that people have a limited span of apprehension and that they have difficulty keeping all the important variables in mind at any one time.[7] As a result, we often approach complex decisions in a piecemeal manner—focusing now on these considerations, now on those. Sometimes this leads to indecision, or to decisions based on only part of the set of relevant factors; sometimes the difficulty and emotional wear and tear lead to a decision by default.

The second assumption is that whatever the factors being focused on at the moment of decision, the individual will choose that decision alternative that promises to be of maximum benefit to himself; the way in which benefits are evaluated is in concordance with an appropriate and mathematically defensible model from decision theory.[8] The model used in this research is explained below. Let us make it clear from the beginning, however, that we have no illusions that human decision makers slavishly, or even consciously, follow the dictates of decision theory. It is just that contrary to popular (and, often, professional) opinion, the bulk of human decisions serve fairly well in that they generally lead to desirable results; a model that has these same properties is bound to have some degree of predictive ability. Moreover, there is empirical evidence (cited below) that in at least some circumstances, behavior can be predicted with fair accuracy using the proposed decision model, or its conceptually similar models. In light of this, it seems reasonable to begin our research with this model and to abandon or modify it later as the results require. (See Barclay, Beach, and Braithwaite[8] for the logic of using such models in psychological research.)

From the first two assumptions we hypothesize that if people can be helped to think about the vast number of decision-related factors in an explicit and orderly manner (specifically, by dividing the variables into a hierarchy of meaningful sets, subsets, etc., for separate consideration), a good deal of the irrationality will disappear. Subsequent decisions will be more nearly optimal, in that they can be predicted fairly well by the decision model.

The thrust of the research, therefore, is to develop a method of helping people make an orderly examination of the variables involved in the birth-planning decisions (i.e., their personal values and their expectations that one decision or the other will lead to the eventual realization of these values) and to predict the decisions. The scientific aim is to learn more about the variables people consider relevant to birth planning and to see whether decision theory can reasonably be used as a model of the birth-planning process.

THE MODEL

A thorough explanation of the decision model and its logical and experimental underpinnings can be obtained in Lee.[9] For our purposes, it is sufficient to say that the analysis of a birth-planning decision begins with the personal values that the individual decision maker sees to be related to the birth of a child. Then it moves to assaying the importance, or utility (U_i), of each value to the decision maker, the subjective probabilities (P_i) that each value will be realized if the decision maker were to elect to have the child, and the subjective probabilities ($1-P_i$) that each value will be realized if the decision maker were to elect not to have the child. The decision model treats the two alternatives, child versus no child, as two gambles and calculates the net worth of each gamble, weighting the utilities by the probabilities in order to take riskiness into account. Because the calculations use the decision maker's own judgments of the utilities and probabilities, the final net worth is regarded as subjective. Because the calculations take the degree of riskiness into account, the final net worth is regarded as merely an expectation. And because the calculated net worth is in terms of the decision maker's own private evaluative system rather than in terms of dollars or the like, it is regarded as a utility. Therefore, the result of the model's prescribed calculations is termed a subjective expected utility (SEU) for having a child, $SEU_Y = \sum_{i=1}^{n} U_i P_i$, and for not having a child, $SEU_N = \sum_{i=1}^{n} U_i(1-P_i)$, where the sigma indicates that the products of the utilities and the subjective probabilities for each value are to be summed over the entire range, i, of values associated with the decision. In short, each SEU represents the net worth (balancing the utility of good and the disutility of bad and the various probabilities of these good and bad things coming to pass) the decision maker could expect to have accrue to him if he were to elect one or the other course of action. Of course, the most reasonable thing to do is to elect the course that has the maximum expected net worth (called the maximization of SEU).

The relative favorability of the two courses of action can be summarized by a difference score: $D = SEU_Y - SEU_N$. When the difference is highly positive, the decision maker should elect to have a child; when it is highly negative, the decision should be not to have a child. When the difference is very close to zero, ambivalence exists, and more information is needed to break the deadlock.

PRIOR RESEARCH

The usefulness of the foregoing depends on the extent to which subjective probabilities and utilities can be measured reliably and whether they can be used in the model's calculations to predict decisions successfully. There is ample evidence that subjective probabilities can be reliably measured and that they possess many of the properties of objective probabilities.[10–14] Similarly, the method that will be used to obtain utilities, requiring the decision maker to allocate a given number of points to each member of a set of values in proportion to their importance to him or her, has been shown to yield reliable and useful measures of utility.[15–18] Other investigations have used such subjective probabilities and utilities to predict accurately occupational preferences of business students,[19, 20] areas of specialization in graduate programs,[21] and a number of other behaviors.[22]

At the same time that the present study was being developed, other investigators in the family-planning area proposed similar methods for the study of contraceptive use[23, 24] and of birth-planning decisions.[25] Using models mathematically similar to the *SEU* model, furthermore, investigators have predicted attitudes toward birth control,[26, 27] contraceptive use,[28] and the intention to have a third child.[29]

PRESENT STUDY

Based on the assumptions, model, and past research previously discussed, the present study is the first phase of a program on birth planning aimed at both elucidation of values and prediction using the model. This first phase involved development of a comprehensive, hierarchically organized set of values related to birth-planning decisions and comparison of the subjective expected utilities related to birth-planning decisions across subjects differing in sex and parity. The study of the predictability of birth decisions will take 2–4 years to complete, and will be reported when complete.

DEVELOPMENT OF THE HIERARCHY OF BIRTH-PLANNING VALUES

Our first task was to compile a list of the values that people consider relevant to the birth-planning decision. The goal was to evolve a hierarchically arranged list so that a decision maker could consider subparts separately, thus easing the information-processing load. To this we began by reviewing the literature[27, 30–33] to get suggestions from previous studies. We then built on this foundation by interviewing couples and adding the values they mentioned to the list.

Unfortunately, the recent comprehensive reviews of values related to birth planning[34–36] were not available to us at that time. From our review of the literature and from interviews with eight couples, however, a collection of neutrally stated values (i.e., worded so that a positive or negative valence would not be attached automatically to the value) were developed. A hierarchically organized outline of birth-planning values evolved with appropriate categories, category labels, and exemplars of the values in each category defining its meaning (see table 1).

Because the usefulness and generality of the Hierarchy of Birth-Planning Values (Hierarchy) depend on the degree to which it makes sense to a variety of people, an additional 40 persons who had not participated in its construction were asked to assign the exemplar statements to the categories. The degree of agreement concerning where the exemplar value cards belong in the Hierarchy was found to be significant. The result of this aspect of the investigation was that the Hierarchy now contained a fairly comprehensive list of values related to birth planning, that is, hierarchically organized, and that it had reasonably good interjudge reliability.[b]

COMPARISON OF THE SUBJECTIVE EXPECTED UTILITIES ACROSS PARITY GROUPS

The second aspect of the study was to determine what values are related to the birth-planning decision. Are these values similar for husbands and wives? Do they change as a function of family size?

SUBJECTS

Subjects were 83 married couples including 23 with no children, 33 with one child, and 27 with two children. Criteria for inclusion in the study were the following: present use of a contraceptive, no history of infertility or adoption, no history of a sterilization procedure, and probable residence in the Seattle area for at least 2 years. Each couple was paid $2.50 for transportation and, when appropriate, an additional $2.50 for babysitting costs. The couples were recruited from educational and religious institutions. Subjects were primarily highly educated and middle class (see table 2). They were not randomly selected and are not representative of the general population.

PROCEDURES

Subjects were given a 16- by 40-inch display of the Hierarchy (table 1) under conditions in which the husband and wife were in separate rooms. Subjects were asked to assign a plus or a minus to each of the 20 subsets of values to indicate whether that particular subset of values made them want to have a child (+) or not want to have a child (−). Following this procedure, subjects assigned importance ratings to

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[b] More precise details of the development of the Hierarchy may be found elsewhere.[37]

TABLE 1.—*Hierarchy of Birth-Planning Values*

- I. Values centered on self and spouse:
  - A. Personal identity:
    - 1. Physical aspects of having a baby:
      - The experience of being pregnant and giving birth
      - Physical risks of childbirth
      - Having a child would permit a different birth control method
      - Child's effect on wife's physical appearance
    - 2. Growth and maturity:
      - Child as a normal step in my/our ongoing "life process"
      - Child as an opportunity to reproduce myself or my spouse
      - Child's effect on my development as a worthwhile, mature, responsible person
      - Child's effect on spouse's/my ability to be young and flexible
    - 3. Self-concept:
      - Demonstrate to myself and others that I can produce a normal child
      - Child as an opportunity to be a good parent
      - Child's effect on becoming an adequate and mature woman/man
    - 4. Educational and vocational values:
      - Child's effect on the husband's educational or career opportunities
      - Child's effect on the wife's educational or career opportunities
      - Effects of a working mother on the child
  - B. Parenthood:
    - 1. Caring for the child:
      - Caring for a new baby
      - The experience of breast feeding a (another) baby
      - Being depended on by the child
      - The effects of a (another) child on household tasks, responsibilities, and workload
      - Mutual cooperation with my spouse in raising a (another) child
    - 2. Parents' role in education and training a child:
      - Spouse's/my willingness and ability to teach the child specific skills such as athletics or cooking
      - Our willingness and ability to help the child to achieve
      - Our willingness and ability to contribute to the child's formal education
      - Our willingness and ability to pass on religious beliefs and values
    - 3. Parent–child relationships:
      - Observing the child's development
      - Sharing of one's recreational activities with the child
      - Child as a companion now and, perhaps, in old age
      - Holding the child and/or playing with him or her
  - C. Well-being of family:
    - 1. Material well-being of family:
      - Costs of child's food, clothing, shelter, and medical, educational, and recreational needs
      - Child's effect on our having a good house, furniture, appliances, etc.
      - Child's effect on our present financial situation and ability to get and to buy other things we want
      - Child's effect on the amount of money we would have for travel and other forms of recreation
    - 2. Nonmaterial well-being of family:
      - Child's effects on our present mobility, lifestyle, degree to which I/spouse settle down

TABLE 1.—*Hierarchy of Birth-Planning Values*—Con.

Child's effect on our having a good time
Child's effects on relationships among present family members
3. Well-being of self and spouse:
Effects of child (children) on parents' ability to maintain separate roles and have activities separate from spouse and from children
Child's long-range effects on the parents' physical and mental health
Competition with me for my spouse's attention
Competition with spouse for the child's attention
4. Well-being of the marriage:
Child's effect on the time I have for my spouse
Child's effects on my and/or my spouse's commitment to our marriage
The child as a symbol or product of our love
Child's effect on sexual satisfaction in the marriage
Effects of trying to become pregnant upon sexual satisfaction
II. Values centered on children:
A. Family characteristics:
1. Family size and sexes of children:
Child might balance the number of boys and girls in our family
Child's effect on our family's size
2. Ages of parents:
Spouse's/my age at birth of first and/or last child
Our ages when we have grandchildren
Our ages when the child (children) leaves home
B. Health and well-being of children:
1. Sibling (brother-sister) relationships:
Child's effect on present children
Considerations about spacing children so that they do not share the same group of friends or so that they're not too dissimilar in ages, etc.
2. Prospective child:
Child's long-term physical health and psychological adjustment
Child's possible mental or physical birth defects
3. Effects of society on child:
Effects of the existing educational, social, and political systems on the child
Effect of future wars on the child
Effects of the culture's traditional biases (racism, sexism, materialism) on the child
III. Values centered on significant others:
A. Family:
1. Relationships with relatives:
Child's effect on our relations with spouse's/my parents
Provide grandchildren for spouse's/my parents
Child's effect on our relations with spouse's/my brothers and sisters
2. Family traditions:
Child's effect on the similarity of our family to the one in which I/spouse grew up
Child as continuation of our family name and traditions
Child as an opportunity for us to fulfill traditional roles of father and mother
B. Friends:
Child's effect on our relations to our friends who have children
Demonstration that I/we can raise children better than friends can
Child's effect on the degree to which we would be like other people

TABLE 1.—*Hierarchy of Birth-Planning Values*—Con.

    Child's effect on the social pressure we feel to have a (another) child and the way we are treated as a couple
- C. Society:
    - Child (children) as fulfillment of religious values
    - Child in relation to the conservation of natural resources, pollution, population problems, etc.
    - Family's and family life's contribution to stability of society as a whole

TABLE 2.—*Subject Characteristics*

Variable	Parity					
	0	0	1	1	2	2
	Male	Female	Male	Female	Male	Female
Number of subjects	23	23	33	33	27	27
Average age	28.6	25.7	30.4	29.0	32.1	31.2
Average years married	3.5	3.5	5.8	5.8	8.0	8.0
Average age first child	—	—	2.9	2.9	5.1	5.1
Average age second child	—	—	—	—	2.6	2.6
Average years education	17.2	16.0	16.5	16.0	17.2	15.7
Average yearly income	$10,870	$10,870	$12,425	$12,425	$14,445	$14,445
Occupations (percent):						
Professional and managerial	65.2	56.5	63.6	42.4	77.8	22.2
Other	21.7	26.0	21.2	12.1	18.5	11.1
Unemployed	13.0	17.4	15.2	45.5	3.7	66.7
Religion:						
Protestant	10	10	14	15	8	9
Catholic	3	2	2	2	1	1
Jewish	0	1	0	0	3	3
No	10	10	17	16	15	14

each of the categories in the Hierarchy. For example, subjects were asked to consider section IA on the Hierarchy and to "divide 100 points between [sub]categories 1, 2, 3, and 4 proportionally to their relative importance to you." Importance ratings continued from the lowest to the highest levels of the Hierarchy, with the final rating being a division of 100 points among categories I, II, and III.

Probability estimates were obtained next by asking the subjects how certain they were that having a child in the next 2 years would have a particular effect on the attainment of their values. For example, subjects were asked, "How certain are you that having a child in the next 2 years will have a positive [or negative] effect on the attainment of your values concerning the physical aspects of having a baby?" Certainty statements were obtained for each of the 20 lowest level subsets of values on the Hierarchy. Response possibilities and their associated values were the following: absolutely certain (90), very certain (80), certain (70), somewhat certain (60), and uncertain (50). When the valence was positive, the subjective probability of attaining a particular subset of values by having a child (P_i) was the value associated with the degree of certainty, and the subjective probability of attaining a particular subset of values by not having a child ($1-P_i$) was its complement. When the valence was negative, the numbers were reversed.

Expected utility, therefore, was operationally defined as the ratings of importance, and probability was defined as the ratings of the degree of certainty that the values would be brought about by having (or not having) a (another) child in the next 2 years. Subjective expected utility was operationally defined for the decision to have (SEU_Y) and the decision not to have (SEU_N) as the summed product of the utilities and probabilities associated with each decision alternative. A difference score ($D = SEU_Y - SEU_N$) was computed for each of the 20 lowest level subsets of values on the Hierarchy. These difference scores were then summed in several ways to yield the following dependent variables for each subject:

1. One-variable *SEU* differences.......	Summation of *SEU* differences across all categories of the Hierarchy.
2. Three-variable *SEU* differences....	Summation of *SEU* differences up to the highest levels of the Hierarchy: I, II, and III.
3. Eight-variable *SEU* differences....	Summation of *SEU* differences up to the next-to-highest levels of the Hierarchy: IA, IB, IC, IIA, IIB, IIIA, IIIB, and IIIC.
4. Twenty-variable *SEU* differences.	*SEU* differences within each of the lowest levels of the Hierarchy: IA1, IA2, IA3, IA4, IB1 . . . IIIA1, IIIA2, IIIB, and IIIC.

Group differences were evaluated by means of univariate and multivariate analysis of variance procedures. Two-tailed tests of significance were used throughout.

RESULTS AND DISCUSSION

Within-parity, across-sex comparisons of *SEU* difference scores were evaluated by means of the Hoteling One Group T-Square.[38] The *F* values were computed separately for the 3-, 8-, and 20-variable *SEU* differences at each of the three parities. Husbands' and wives' one-variable *SEU* difference scores were compared within parity groups by means of the *t* test. Not 1 of the 12 comparisons reached statistical significance. Husbands did not differ from their wives in their attitudes associated with birth-planning decisions. Husbands and wives within this sample were remarkably homogeneous with respect to *SEU*s associated with birth-planning decisions in all of the three parity groups.

The next question asked was, Do subjective expected utility values associated with fertility decisions remain stable across family size or do they change as parity changes? Differences in group mean scores on the 3-, 8-, and 20-variable *SEU* difference scores were compared across parities by means of discriminant function analyses; the 1-variable *SEU* difference scores were compared by analysis of variance for the three group comparisons and by t test for the two group comparisons.

The attitudes of married males (table 3) toward fertility decisions appear to be more homogeneous across parity groups than those of married females (table 4). The differences that existed for males were primarily in the lowest level of the Hierarchy. Husbands with no children differed from husbands with two children on the 20-variable *SEU* difference scores ($X^2 = 34.335, df = 20, p < .05$). For men, having two children leads to changes across a large number of small discrete factors relevant to fertility decisions.

Among married females, the importance of values and the associated degree to which such values are perceived as being attained by having a (another) child change significantly as a function of parity. All comparisons across the three parity groups were significant as were all comparisons between women with no children and women with one child. Achieving motherhood changes attitudes toward future fertility decisions. The lack of significant differences between females with one and two children, on the 8- ($X^2 = 12.735$, $df = 8$, ns) and 20- ($X^2 = 28.031$, $df = 20$, ns) variable *SEU* difference scores suggest that the small discrete attitudes toward fertility decisions become set once motherhood has been attained.

The direction of change in overall attitudes toward family-planning decisions is shown in figure 1, which plots group mean scores on the 1-variable *SEU* differences. Remember that positive scores indicate maximizing *SEU* by having a (another) child, negative scores indicate maximizing the attainment of values by not having a (another) child, while values near zero represent ambivalence. In our sample, becoming a father or mother is viewed as mildly positive. Once parenthood has been attained, attitudes toward having a second child are very positive. A significant drop in the *SEU* for having a third child, however, is present for both fathers ($t = 1.96, df = 58, p = .05$) and mothers ($t = 2.90, df = 58, p < .01$). Having a third child is viewed very negatively in both instances. Although married women are reported to want somewhere between 2.5 and 3.4 children,[39] fathers and

TABLE 3.—*Within-males across-parity comparisons of SEU difference scores*

Variable	Across-parity comparisons															
	0-1-2				0-1				0-2				1-2			
	F	X^2	*df*	*p*	*t*	X^2	*df*	*p*	*t*	X^2	*df*	*p*	*t*	X^2	*df*	*p*
1-variable ***SEU*** differences	1.991	......	2 and 80	*ns*	-.64	......	54	*ns*	1.19	......	48	*ns*	1.96	......	58	.05
3-variable ***SEU*** differences	.....	8.876	6	*ns*	.....	4.152	3	*ns*	.....	6.195	3	*ns*	.....	5.294	3	*ns*
8-variable ***SEU*** differences	.....	28.155	16	<.05	.....	9.963	8	*ns*	.....	14.227	8	*ns*	.....	10.879	8	*ns*
20-variable ***SEU*** differences	.....	54.532	40	<.06	.....	27.953	20	*ns*	.....	34.335	20	<.05	.....	23.301	20	*ns*

TABLE 4.—*Within-females across-parity comparisons of SEU difference scores*

Variable	Across-parity comparisons															
	0-1-2				0-1				0-2				1-2			
	F	X^2	*df*	*p*	*t*	X^2	*df*	*p*	*t*	X^2	*df*	*p*	*t*	X^2	*df*	*p*
1-variable ***SEU*** differences	4.408	......	2 and 80	<.05	-2.10	......	54	<.05	.71	......	48	*ns*	2.90	......	58	<.01
3-variable ***SEU*** differences	.....	18.333	6	<.01	.....	10.554	3	<.01	.....	7.254	3	.06	.....	8.386	3	<.05
8-variable ***SEU*** differences	.....	50.209	16	<.01	.....	28.092	8	<.01	.....	24.474	8	<.01	.....	12.735	8	*ns*
20-variable ***SEU*** differences	.....	71.368	40	<.01	.....	43.174	20	<.01	.....	37.044	20	<.01	.....	28.031	20	*ns*

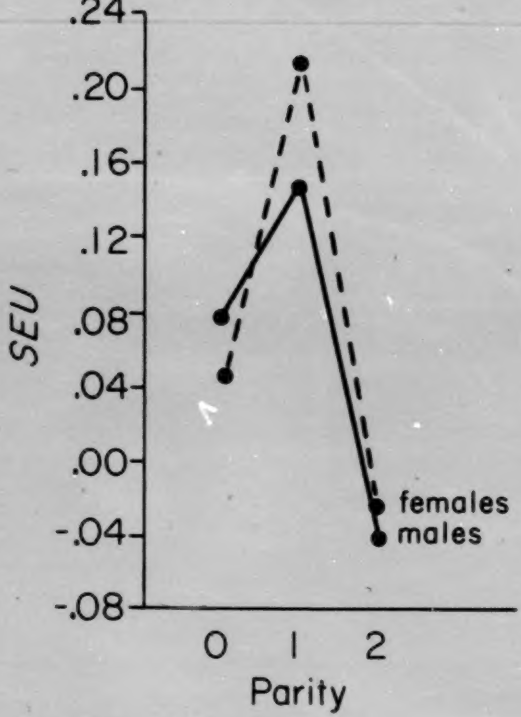

FIGURE 1.—Subjects' mean 1-variable *SEU* difference scores by parity.

mothers in this sample rate the birth of a third child as interfering with the attainment of their values.

The final question is, How do the subjective expected utilities associated with birth-planning decisions change as a function of family size? What attitudes change as husbands and wives consider increasing their family size from zero to two to three children? Group mean scores on the 3-, 8-, and 20-variable *SEU* differences are plotted in figure 2 for males and in figure 3 for females.

For husbands without children, the most important childbearing considerations are those related to the experience of parenthood. Parenting is the single most important motivation, not the impact of the child on the self, spouse, marriage, significant others, or society. The positive aspects of becoming a father are the father's role in educating and training the child and the opportunity to establish a close relationship with another human being—caring for and being depended on by a child and from the sharing of mutual interests. A second motivation

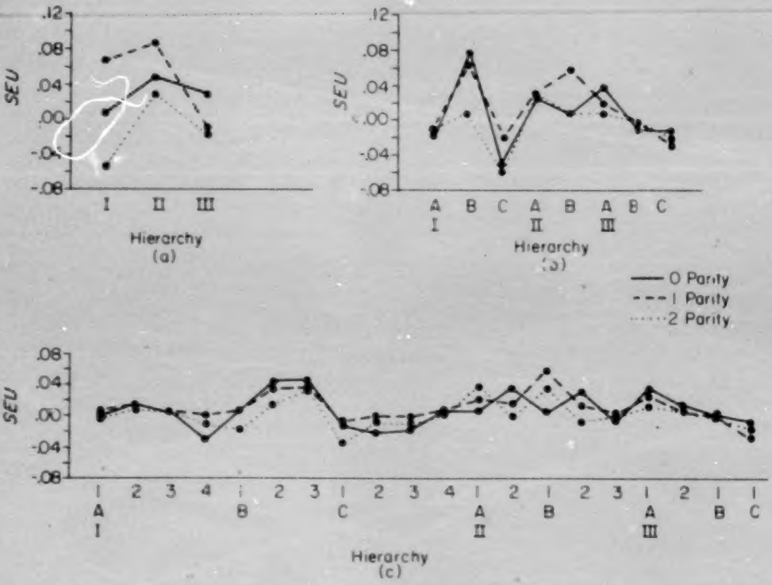

FIGURE 2.—Mean scores by parity of male subjects on the (a) 3-, (b) 8-, and (c) 20-variable *SEU* difference scores.

for childbearing among prospective fathers is to sustain and improve relationships with relatives. The first child is seen as bringing the couple into closer relationship with brothers, sisters, and prospective grandparents. The most compelling reason not to become a father is interference in achieving educational and vocational goals. Husbands feel that having a first child might prevent himself and/or his wife from attaining educational and career goals.

Once having become a father, motivations for parenthood remain high. When fathers consider having a second child, the same components again are viewed positively—namely, the opportunity to assist the child in developing competence and to benefit from the relationship with the child. At this stage of family development, though, a second and more important childbearing consideration is the prospective child's effect on the existing child. Establishing positive relationships among siblings appears to be fathers' most powerful motivation for having a second child. The affiliative value of the second child, therefore, extends beyond the father-child relationship to the relationship between children. Fathers recognize, however, the negative impact of a second child on the attainment of societal values, such as the conservation of resources, environmental pollution, and increasing population.

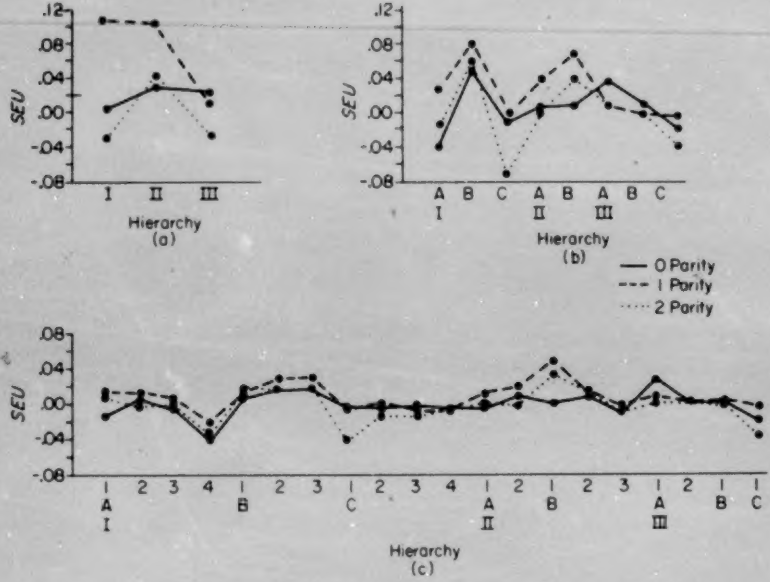

FIGURE 3.—Mean scores by parity of female subjects on the (a) 3-, (b) 8-, and (c) 20-variable *SEU* difference scores.

Fathers are, in general, ambivalent or negative about having a third child. Fathering was once an important value, but such needs appear now to be met with two children. The most compelling reasons for having a third child are the attainment of desired values related to family size and sexes of children accompanied by concern for sibling relationships. These considerations are outweighed, however, by the perception that the third child will have a very negative influence on the material well-being of the family. The anticipated financial costs of raising a third child is the most inhibiting factor in fathers' childbearing considerations.

Among wives without children, the single most important motivation for childbearing is the attainment of values related to significant others. Becoming a mother establishes, maintains, and enhances affiliation with parents and other family members. Contrary to our expectations, parenting needs among women without children were secondary to establishing close relationships with relatives. Women without children were ambivalent about the impact of the child on the attainment of values related to themselves, their spouse, their marriage, and society. The prospect of having a child, furthermore, was perceived as interfering with their ability to achieve educational and career goals. Women in this group seek to maintain roles other than mothering and view childbearing as inhibiting their ability to achieve roles outside of the home.

Once a woman has had one child, however, the motivations for further childbearing are very high in terms of realizing values related to self, spouse, and children. Affiliative needs with significant others become much less important and are replaced by desires for mothering per se. Mothers with one child are very positive about caring for another baby, the opportunity to assist in the development and training of a second child, and the companionship with another human being. The single most important motivation for having a second child, however, is to provide a playmate and a friend for the first child. Thus, the affiliative needs of the only child provide a strong motivation for further childbearing. Again, interference with the attainment of educational and vocational goals is the primary inhibiting factor on mothers' consideration of having a second child.

The importance of mothering remains very high among women considering the possibility of having a third child. Apparently the experience of mothering two children does not diminish the importance of parenthood. Rather the value placed on having an educative role with subsequent children and the opportunity to establish yet another close relationship with a natural child are enhanced. The experience of mothering increases the value of parenting. Again, the single most important factor for having a third child is the influence of the prospective child on existing children. The third child is seen as having a positive effect on sibling relationships. In the case of women considering the possibility of a third child, however, economic considerations join educational and career factors as major deterrents to further childbearing.

SUMMARY AND CONCLUSIONS

This investigation was the first phase of a program aimed at exploring birth-relevant values and the application of subjective expected utility theory to the study of birth-planning decisions. A comprehensive range of birth-planning values for well-educated young adults was obtained and organized into the Hierarchy of Birth-Planning Values. This instrument was then administered to 83 couples of different parities. Group differences in subjective expected utilities related to birth-planning decisions were compared.

Husbands and wives were remarkably similar in their values associated with birth-planning decisions, although in both groups values pertaining to fertility decisions changed as a function of family size. Couples without children were ambivalent about the prospect of having a child. Parents with one child were very positive about having a second child. Those with two children were negative about the prospect of having a third child.

In considering the possibility of having a first child, husbands' positive considerations centered around the opportunity for experiencing parenthood, while wives saw the birth of the first child as an opportunity to enhance relationships with relatives. Perhaps one strong factor for becoming a mother is to have a baby for other family members, presumably the prospective grandparents. After experiencing motherhood, however, motivations for parenting among women are very high and remain high even while considering the possibility of a third child. In contrast, fathers' motivation for parenthood is significantly diminished after having two children. The primary motivation for having a second child among both mothers and fathers is to provide companionship for the existing child. There appears to be a strong cultural bias against having an only child. At all stages of family size, the impact of the child on society is viewed at best as ambivalent and generally as negative. In addition to values related to society, the attainment of educational and vocational goals plus economic concerns were the major deterrents to further childbearing.

The sample currently is being extended to measure the importance and associated probabilities of values related to birth-planning decisions among couples with three and four existing children. We will then be able to compare subjective expected utilities across the major parity groups and determine the primary factors impinging on fertility decisions. During the second and third years of the study, the accuracy of the behavioral decision model in predicting birth outcomes will be evaluated. The hope is to determine the range of ambivalence below which couples seek to maximize their values by not having children and above which couples seek to maximize their values by having children. Couples in the ambivalent range might then be aided, through counseling, to crystallize their values so as to have that number of children that will bring about maximum benefit to themselves. Thus, we will be able to help people make an orderly examination of the variables involved in the birth-planning decision and will have learned more about the variables people consider relevant to birth planning.

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Chapter 11

Social-Psychological Determinants of Fertility Intentions[a]

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With the increase in the proportion of planned families, intended family size has become an important component in the study of fertility behavior. Accordingly, during the past 30 years, major investigations of fertility and family-planning behaviors of the American population (e.g., the Indianapolis study[1] and the Princeton studies[2]) have attempted to determine social and psychological correlates of ideal family size and intention to have children. Generally speaking, these studies have been successful in measuring and describing social and demographic variations in fertility. Unfortunately, their attempts to predict family-size intentions from psychological or social psychological variables have, for the most part, been unsuccessful. With these and other negative findings in mind, many demographers and family planners have expressed skepticism regarding the utility of psychological variables in fertility research (see, e.g., Mauldin[3]).

Recently, Fishbein[4] has proposed a social-psychological approach to the study of family-planning behaviors that not only suggests an explanation for previous failures to find psychological correlates of family-planning behaviors, but also suggests the kinds of variables that should be studied if family-planning behaviors are to be understood. Fishbein's approach is based on a general model of behavioral intentions.[5] The model is expressed in the form of a multiple-regression equation in which two components are represented as influencing a person's behavioral intention. The exact weights assigned these two components in a given situation are determined by multiple-regression procedures. The model specifies that the performance of a given behavior (B) is a direct function of the intention to perform that behavior. A behavioral intention (BI), in turn, is determined by two components: (1) the sum of one's beliefs (subjective probabilities) about the consequences of performing the behavior times the evaluation of those beliefs ($\Sigma B_i a_i$) and (2) the sum of one's normative beliefs about what others think she should do times her motivation to comply with those others ($\Sigma NB_i Mc_i$). This model is expressed by the following formula:

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[a] This paper was presented at the symposium entitled "Theoretical and Methodological Approaches to the Study of Population Issues" held at the annual meeting of the American Psychological Association, New Orleans, Sept. 1974. Portions of these data have been reported in the *Journal of Personality and Social Psychology* 31(6):1073–1082, 1975. The research reported was supported by research grant NIH-HD-07024-01 from the Center for Population Research, National Institute of Child Health and Human Development, and in part by a predoctoral fellowship awarded A. R. Davidson by the National Science Foundation. The authors wish to thank Martin Fishbein and Harry C. Triandis for helpful suggestions about the research.

$$B \sim BI = \left[\sum_{i=1}^{n} B_i a_i\right] W_1 + \left[\sum_{i=1}^{m} NB_i Mc_i\right] W_2 \qquad (1)$$

where W_1 and W_2 are empirically determined regression weights.

The present study was designed to test the generalizability of the Fishbein formulation to a wide variety of respondents and to a new sample of behavior, that is, fertility behavior. In this context, the following hypothesis was tested in a field survey design: A woman's intention (BI) to have a child during the next 2 years can be predicted from a linear combination of her beliefs and evaluations concerning the consequence of having a child during the next 2 years ($\Sigma B_i a_i$) and her normative beliefs weighted by her motivation to comply with those norms ($\Sigma NB_i Mc_i$).

METHOD

SURVEY SAMPLE

The respondents consisted of a stratified random sample of 270 women in Champaign-Urbana, Ill. To be included in the sample, women had to meet the following criteria: (1) currently married, (2) not separated from husband, (3) between the ages of 18–38, (4) Caucasian, and (5) not currently married to a university student. These women were stratified in terms of three levels of socioeconomic status (SES) and two levels of religious affiliation (Catholic, Protestant).

SAMPLING

The sampling procedure was designed to randomly select 45 women, each meeting the five criteria, for each cell of the 2 by 3 design. A set of names was randomly selected from the city directory, which lists every residence in the Champaign-Urbana cities. Respondents were initially contacted via telephone by trained female interviewers. The purpose of the phone interview was (1) to determine if the woman met the sampling criteria, (2) to determine the cell of the design of which she was a member, (3) to find out if she was willing to fill out the final questionnaire, and, if yes, (4) to set a date for the interview.

INTERVIEWS

Each interview was conducted in the respondent's residence. It required approximately 1 hour to complete the self-administered questionnaire, for which the respondent received $10.

MEASUREMENT PROCEDURE

In order to insure that relevant beliefs and reference groups were included in the final questionnaire, initial elicitation interviews were conducted with an independent sample of 55 women. The women were randomly selected from the same population as the women in the final sample. The interviews were aimed at isolating those referents and beliefs applicable to the behavior under study. From these interviews, nine beliefs and four referents were selected to be included in the final survey.

Measures of (1) intention to have a child during the next 2 years, (2) beliefs about the consequences of having a child during the next 2 years, (3) the evaluations of those consequences, (4) beliefs about what relevant others think she should do, and (5) motivation to comply with those others were obtained in a closed-format questionnaire. Measures were embedded in a larger questionnaire. The measurement procedure is based on the semantic differential technique and is described in Jaccard and Davidson.[6]

RESULTS

A multiple-regression analysis was performed regressing $\Sigma B_i a_i$ and $\Sigma NB_i Mc_i$ on BI. Consistent with the Fishbein model, a significant multiple correlation ($R = .804, p < .01$) was observed between the two components and BI. Both the additudinal and normative components received significant regression weights in the prediction of the intention to have a child during the next 2 years ($b = .517, p < .01; b = .386, p$

$< .01$, respectively). To estimate the population validity of the sample regression equation, double cross-validation[7] was performed. The cross-validated multiple correlation ($R = .801$, $p < .01$) represents a reduction of only .003 in the magnitude of the correlation. It is safe to assume, therefore, that the obtained equation could be applied to the population with very minimal reduction in predictive utility.

The multiple correlation regressing $\Sigma B_i a_i$ and $\Sigma NB_i Mc_i$ on BI was also computed within each of the six cells of the sampling design. These correlations ranged from .784 to .855 (all p's $< .01$), with a mean of .821. To determine if the model was differentially predictive of BI for different subsets of the population, a 2 by 3 chi-square analysis—that is, Catholic, Protestant by high, middle, low SES (see Jones[8] for an elaboration of this statistical technique)—was performed on the within-cell multiple correlations. This analysis revealed no significant main effect for religion or SES and no significant interaction. It can be concluded, therefore, that the model is highly predictive of fertility intentions and that these correlations are equally high in each of the major subsamples included in the present study.

As was previously mentioned, the $\Sigma B_i a_i$ component received a significant regression weight in the prediction of BI. This suggests that an analysis of the beliefs should give additional insights into variations of intentions. Specifically, it would be of interest to compare the beliefs of those who intend to have a child during the next 2 years with the beliefs of those who do not. Simultaneous confidence intervals comparing the difference between means on the belief and evaluation variables for those who intend to perform the behavior and those who do not were computed.[b] Table 1 presents the mean scores for the two groups on the beliefs and evaluations and indicates those differences that are statistically significant.

As seen in table 1, all but one of the beliefs significantly differentiated between women who intend to have a child during the next 2 years and those who do not. Thus, in comparison to those women who do not intend to have a child, women intending to have a child during the next 2 years thought it more likely that this behavior would "fulfill my family life" and "make my marriage stronger," and less likely that it would lead to "having a child I could not afford," "being overly restricting on my freedom," and "too much of an emotional strain." By comparison, table 1 indicates that only one of the evaluations—having the added responsibility of an additional child at this time—significantly differentiated between women who intend and women who do not intend to have a child during the next 2 years. This pattern of results indicates that for our sample, both women intending and

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[b] For a discussion of simultaneous comparisons of multiple sets of means, see Morrison.[9]

TABLE 1.—*Mean scores on beliefs and evaluation of beliefs for those who intend and do not intend to have a child during the next 2 years*

Consequence	Mean belief score[1] (likely–unlikely)		Mean evaluation score[1] (good–bad)	
	Intend[2]	Not intend[3]	Intend[2]	Not intend[3]
Having a child I could not afford	[4]−2.36	.04	−1.94	−2.19
Having more children than I want	[4]−2.74	1.64	−.91	−1.60
Too much of an emotional strain	[4]−2.57	.72	−2.19	−2.21
Overly restricting on my freedom	[4]−1.02	1.25	−1.19	−1.65
Make my marriage stronger	[4].69	−1.44	2.36	2.25
Too great a physical strain	[4]−2.42	.14	−2.13	−2.16
Fulfill my family life	[4]2.26	−2.17	2.74	2.12
Having an added responsibility at this time	1.79	2.18	[4]1.57	−1.29
Having a child while I am at a good age	[4]2.58	.29	2.87	2.22

[1] All scales range from +3 to −3.

[2] $N = 204$.

[3] $N = 53$.

[4] Mean difference for intend-not intend is significant, $p < .01$.

women not intending to have a child during the next 2 years tend to have similar evaluations of the consequences of performing that behavior. What differentiates the two groups are their beliefs concerning the probability that performing the behavior will lead to those consequences.

As the normative component also received a statistically significant regression weight, a similar series of analyses were performed on the normative beliefs and motivations to comply. Table 2 presents the mean scores of the two groups on normative beliefs and motivations to comply and indicates those differences that are statistically significant. As seen in the table, respondents intending to have a child during the next 2 years thought it more probable that their husband, close friends, parents, and doctor wanted them to have a child during the next 2 years than did women not intending to have a child. Table 2 also indicates that there were no significant differences between the two groups on motivations to comply with the referents. The similarity in motivation-to-comply ratings is due, in part, to the fact that only "significant referents" were included in the present study; that is, both

TABLE 2.—*Mean scores on normative beliefs and motivations to comply for those who intend and do not intend to have a child during the next 2 years*

Referent	Mean normative belief score[1] (likely–unlikely)		Mean motivation to comply score[1] (comply–not comply)	
	Intend[2]	Not intend[3]	Intend[2]	Not intend[3]
Husband	[4] 2.36	−2.39	1.79	1.87
Close friends	[4] 1.45	−1.91	.21	.21
Parents	[4] 1.30	−2.06	.40	.51
Doctor	[4] 1.11	−1.91	2.06	2.09

[1] All scales range from +3 to −3.

[2] $N = 204$.

[3] $N = 53$.

[4] Mean difference for intend-not intend is significant, $p < .01$.

groups of respondents were motivated to comply with each of the referents.

DISCUSSION

The hypothesis derived from the Fishbein model of *BI* was supported by the data. For the total sample, the model provided a highly accurate prediction of the intention to have a child during the next 2 years. The high multiple correlation of the model's components with *BI* observed within each of the major subsamples indicates that for the prediction of fertility intentions, the model is probably generalizable to the majority of the American population. The predictability of the model was unaffected by such factors as socioeconomic status, level of education, or religion.

The utility of the model in predicting fertility intentions indicates that future research should investigate the extent to which the model is capable of predicting fertility behavior. In this respect, the authors are monitoring the present sample in a longitudinal design to determine the degree to which the intention to have a child within the next 2 years does predict whether the respondent has a child during that time and the kinds of factors that may influence the relation.

From the perspective of population research, this investigation has a number of applied implications. First, the analyses on beliefs about having a child during the next 2 years identified those items that differentiated between intenders and nonintenders and suggest which beliefs one might seek to change in order to influence an individual's fertility intentions. Second, the present investigation indicates that fertility-related intentions may be understood in terms of the theoretical model of *BI*. Generally speaking, demographers have been unable to identify the specific factors that underlie such important variables as intended fertility behavior, etc. Attempts to predict such variables from a psychological perspective have been unsuccessful for the most part. In contrast, the present data indicate that fertility intentions can be predicted when approached from a strong theoretical framework.

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Chapter 12

Test–Retest Reliability in Population Research: Questionnaire and Respondent Contributions[a]

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The widespread use of the questionnaire and interview as measuring instruments in population research has been unaccompanied, for the most part, by evaluation of their reliability. More than 25,000 publications in the field of population were referenced in the *Population Index* during the 1960's, which gives an indication of the breadth of research in this growing field. Nevertheless, virtually none of these studies has addressed itself to the problem of the reliability of the data being used. This omission is a serious one. Without assurance that responses are reliable, a researcher can never be certain that he is measuring the variable he intends to measure. In other words, validity presupposes reliability.

Ryder and Westoff's[1] recent contribution to the study of fertility includes reinterview data on 382 white, married, adult women. It thus represents one attempt to assess consistency, or stability, of knowledge, attitudes, and practice (KAP) responses over time. The present study adds to these much needed methodological data by presenting test–retest reliability results for teenagers who completed questionnaires focused on issues in family formation and population. The goal of this study was to ascertain if and how reliability is differentially affected by characteristics of the questionnaire and of the respondent. Specifically, it asked whether reliability varies as a function of item content (personal history, family formation, population), the psychological nature of the item (knowledge, attitudes, beliefs and opinions, desires, expectations, and intentions), and as a function of subject characteristics (sex, age—younger vs. older teenagers—race—white vs. nonwhite—and religion—Catholic vs. non-Catholic).

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SOURCES OF DATA AND METHODS OF ANALYSIS

RESPONDENTS

The study was conducted as part of a larger study of the attitudes of teenagers regarding family formation and population growth,[2] as gaged from self-administered questionnaires. The original sample was drawn to allow subgroup comparability by race, sex, age, and religion. It consisted of 941 students from six junior high schools, seven high schools, and three colleges in the Washington, D.C., metropolitan area. Four participating schools were public and 12 were private. Six were located within the District of Columbia boundaries and 10 were outside. (It might be noted that schools in the District of Columbia are predominantly public, and their students are predominantly black.) At each of the cooperating junior high schools, all ninth graders were tested, and at each of the cooperating high schools, all 12th graders were tested. Respondents at the college level came from classes in which enrollment was predominantly at the sophomore level. All students were tested in their own classrooms or in the school auditorium. Respondents were assured of anonymity and further informed that they were not obliged to answer any question they preferred not to answer.

Six schools allowed their students to be retested, and students from those schools comprised the reliability subsample. There were 288 students from three public and three private schools who were retested. The age, race, sex, and religious distribution of those students is shown in table 1.

TESTERS

Two or more testers were present at each session when questionnaires were filled out. They reviewed the instructions with the class, acted as proctors during the session, and answered definitional questions as needed. The pool of available testers, most of whom were college age, included three white males, two white females, one black male, and one black female. Every effort was made to assign to any one session testers who differed by sex and/or race.

QUESTIONNAIRE

The questionnaire, which took approximately 40 minutes to complete, consisted of 125 items grouped by subject matter into the follow-

TABLE 1.—*Background characteristics of respondents*

Characteristic	*N*	Percent
Age:		
Younger (≤16)	128	44.5
Older (≥17)	153	53.1
Not stated	7	2.4
Total	288	100.0
Race:		
White	146	50.7
Nonwhite	142	49.3
Total	288	100.0
Sex:		
Male	101	35.1
Female	185	64.2
Not stated	2	.7
Total	288	100.0
Religion:		
Catholic	110	38.2
Non-Catholic	128	44.4
Not stated	50	17.4
Total	288	100.0

ing three parts: (1) background information and personal history items concerning the student and his family, (2) items concerning family structure and formation (e.g., At what age would you like to marry?), and (3) items concerning population growth (e.g., Is the rate of world population growth a serious problem?). Most of the answers were multiple choice; both the median and modal number of alternative answers was 4 per question (range = 2–10). Reliability index values were not differentially affected as a function of number of alternative answers per question.

Construction of the questionnaire was determined primarily in terms of its subject matter, as just outlined. A secondary interest of the study was to analyze reliability of the questionnaire in terms of its psychological attributes. With this goal in mind, the 125 questionnaire items were submitted to four postgraduate judges who independently categorized each item. The category definitions given to the judges were as follows:

1. Knowledge, factual information, and empirically verifiable beliefs. (In these items, the cognitive component is uppermost.)
2. Attitudes, opinions, and beliefs that are not empirically verifi-

able or easily verifiable. (In these items, the cognitive component is not uppermost.)

3. Desires, wishes, intuitions, expectations, hopes, and wants. (These items are personal and future oriented.)

The median percent agreement among the four judges was .88. In tabulating reliability of questionnaire items as a function of their psychological nature, only those items were used that three or more judges categorized identically.

INDEX OF RELIABILITY

The measure of reliability used in the present study is taken from Meltzer and Hochstim.[3] (The Meltzer and Hochstim index is conceptually the reciprocal of Ryder and Westoff's "coefficient of inconsistency.") This index corrects for chance agreement. In calculating this index, chance agreement is determined from the marginal distributions of a contingency table formed by crossing the test responses to a questionnaire with the retest responses to the same questionnaire. The resulting index represents the ratio of the difference between observed and expected agreements to the difference between maximum possible and expected agreements. When multiplied by 100, the resulting index value ranges between 0 and 100. A value of zero means that the only agreement between responses was that expected by chance. A value of 100 indicates perfect agreement, that is, maximum reliability. The formula is expressed as follows:

$$\text{Index of reliability} = \frac{\text{observed agreement} - \text{expected agreement}}{\text{maximum agreement} - \text{expected agreement}} \times 100$$

Appendix A discusses the definition and measurement of reliability more fully.

RESULTS

ANALYSIS BY CONTENT

The median and mean reliability indexes for each part of the questionnaire are shown in table 2. For the questionnaire as a whole and for each content category separately, median and mean indexes are highly similar in magnitude, indicating that the corresponding distributions were not noticeably skewed.

Items in which the content refers to background information (e.g., age, sex), personal or family history (e.g., In what region of the United States did your father grow up?), or future plans (Do you plan to attend college?) are the most stable from test to retest. Those items in which the content refers to family structure and formation (e.g., Would you

TABLE 2 —*Median and mean reliability indexes for items grouped according to item content*

Content	*Mdn*	Quartile	*M*	*SD*
Background	70	11.5	68.94	14.47
Family	49	7.5	48.93	10.01
Population	36	6.0	34.14	10.81
All	47	11.5	47.37	18.73

ever consider adopting a child?) are markedly lower in test-retest reliability. Finally, the lowest average reliability is shown by items in which the content refers to various dimensions of national and international population growth rates (e.g., How many people are there in the U.S.? Should there be government penalties on large families?).

How do differences in item content lead to differences in reliability? The most salient and parsimonious explanation for these differences is in terms of differences in familiarity with the three types of content. Whether his mother works primarily as a housewife or outside the home is documented every day in the teenager's life. But it is not every day that the teenager—or adult, for that matter—considers how many children he wants (family formation) or if the rate of U.S. population growth poses a serious economic threat (population). Another way of conceptualizing this is that different subject matters have different frequencies of cognitive exposure, or repetition, in the respondent's everyday life. This consideration also should give added impetus to population educators, indicating as it does the dire need for repeated exposure to population education material. There is also the possibility to consider that lower reliabilities may indicate that educational efforts will meet with less resistance to the input of new information.[b]

ANALYSIS BY PSYCHOLOGICAL ATTRIBUTES

As noted before, each of the 125 questionnaire items was categorized along a dimension orthogonal to its content or subject matter, namely, the psychological attributes of knowledge, attitudes, and desires. In categorizing the total 125 items, the four judges agreed unanimously on 100 items, and in three judgments out of four, on another 20 items. Table 3 shows median and mean reliability indexes for these 120 items, grouped according to psychological attributes.

As table 3 indicates, the knowledge items, heavily loaded as they are with a cognitive component, show the most stability over time. These items have an overall median reliability index of 70. The

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[b] The author is grateful to Nancy Russo for this suggestion.

TABLE 3.—*Median and mean reliability indexes for items grouped by psychological attributes*

Psychological attributes	*Mdn*	Quartile	*M*	*SD*
Knowledge	70	18.13	64.56	21.37
Attitudes	37	7.63	39.13	12.07
Desires	55	5.50	54.67	7.36
All	44.5	11.83	47.43	19.19

generalization has often been advanced that items reflecting factual knowledge, cognitive content, or concrete behavior are more reliable than those reflecting inferences, emotional content, or attitudes (see, e.g., Ryder and Westoff[1]). It is tempting to draw the same conclusion in the present case. However, it will be seen that this is too gross a generalization if the 32 knowledge items are broken down into those pertaining to the respondent's knowledge of his own background and those pertaining to his knowledge of population growth. The mean reliability index for the former is 72, whereas that for the latter is 38. Such a large discrepancy indicates that cognitive loading in and of itself is insufficient grounds for predicting high reliability. One must also take into account the frequency of cognitive exposure to the subject matter with which the items are concerned.

Perhaps the most interesting difference in reliability is that between the items representing attitudes, opinions, and beliefs (median = 37) and those representing desires, intentions, and expectations (median = 55). These items are commonly lumped together in demographic KAP surveys. The present data indicate that they are not psychologically of the same dimension even though desires may logically be considered a species of the genus attitudes. Young people may not have very stable attitudes about personal goals, career aspirations, family projections, and population, but they do know what they want.

ANALYSIS BY RESPONDENT CHARACTERISTICS

The reliability of the questionnaire was also analyzed in terms of four important demographic characteristics of the respondents: sex, age, race, and religion. Table 4 contains median reliability indexes for the questionnaire as a whole and for its three content areas as a function of these respondent characteristics. Table 5 contains mean reliability indexes for the same breakdown.

Analysis of reliability by sex revealed that there were no consistent differences related to this variable. Boys were no more reliable than girls, and vice versa. This finding is not inconsistent with previous

TABLE 4.—*Median reliability indexes as a function of item type and of respondent characteristics*

Respondent characteristics	Questionnaire items							
	All items (*N*=125)		Background information (*N*=36)		Family formation (*N*=30)		Population (*N*=59)	
	Index	QD[1]	Index	QD	Index	QD	Index	QD
All subjects	47	11.5	70	11.5	49	7.5	36	6.0
Sex:								
Male	48	11.0	67	13.0	48	7.5	37	10.5
Female	45	14.0	70	9.0	52	9.5	35	5.5
Age:								
Older	48	13.0	76	10.5	55	7.0	39	5.5
Younger	43	13.0	64	10.5	48	9.0	33	8.5
Race:								
Nonwhite	42	13.5	60	6.5	45	10.0	30	8.0
White	51	12.5	76	14.0	55	8.5	40	7.5
Religion:								
Catholic	51	12.5	78	14.5	54	5.5	43	8.5
Non-Catholic	47	14.0	73	11.5	48	6.0	33	7.5
Religion—whites only:								
Catholic	56	14.0	83	15.5	59	11.0	42	12.0
Non-Catholic	48	12.0	73	15.5	50	7.5	35	12.0

[1] QD = quartile deviations.

TABLE 5.—*Mean reliability indexes as a function of item type and of respondent characteristics*

Respondent characteristics	All items		Background information		Family formation		Population	
	Index	*SD*	Index	*SD*	Index	*SD*	Index	*SD*
All subjects	47.37	18.73	68.94	14.47	48.93	10.01	34.14	10.81
Sex:								
Male	48.78	18.53	69.50	16.28	47.03	10.05	37.73	11.98
Female	49.39	18.38	71.24	13.96	50.63	11.73	36.17	8.53
Age:								
Older	51.85	18.85	73.47	13.82	53.80	11.82	38.39	10.43
Younger	44.29	18.44	62.32	19.04	46.43	12.54	32.81	10.14
Race:								
Nonwhite	43.50	17.68	63.62	13.16	45.53	11.48	30.86	9.57
White	51.22	19.00	74.03	17.11	54.27	12.12	40.69	10.27
Religion:								
Catholic	53.51	18.81	72.53	19.24	54.00	12.17	42.31	10.92
Non-Catholic	48.02	18.91	70.18	14.86	47.10	11.70	35.73	10.79
Religion—whites only:								
Catholic	56.03	21.10	75.38	22.57	56.50	16.93	44.64	12.31
Non-Catholic	48.55	20.60	68.47	21.12	49.87	10.84	36.41	14.01

literature; it may be attributable to the fact that relevant published comparisons are almost nonexistent. However, it should also be remembered that negative results are published less often than positive results.

Analysis by age shows that older subjects responded more consistently than did younger subjects to each content component of the questionnaire and consequently to the questionnaire as a whole. This finding is consistent with the literature, most of which can be found in the domain of intelligence testing.[c]

In areas closer to demography and population, there are two analyses of reliability by age that agree with the present findings. First is Meltzer and Hochstim's[3] finding that older adult respondents gave more reliable reports in a physical health survey than did younger adults. A second comparison is available from the Ryder-Westoff[1] study. Those investigators asked three questions of married, adult female respondents that are comparable in content to questions asked of teenagers in the present study: desired number of children for self, ideal number of children for the American family, and husband (or father's) occupation. Reliability indexes are consistently higher for Ryder and Westoff's older subjects than for our younger ones. In addition, the extent of the difference is remarkably similar for the three questions, being 10, 9, and 11 index points, respectively.

The most striking differences in reliability shown in tables 4 and 5 are those related to race. Nonwhite respondents, who were with few exceptions black, were uniformly and markedly less consistent than white respondents on all parts of the questionnaire. This result agrees with that of Ryder and Westoff who found that blacks showed less interview–reinterview agreement than did whites on 16 of 23 behavioral and attitudinal variables. This was true whether the data were analyzed for individual or aggregate agreement. Further, the racial difference was not reducible to differences in educational attainment.

The most obvious explanation for a racial difference in reliability lies in lower test-taking motivation on the part of blacks. For several years now, many black spokesmen have criticized tests and similar assessment devices on several grounds, all of which are alleged to discriminate against the nonwhite test taker.[5]

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[c] To take extreme cases, it has long been recognized in psychology that infant tests are considerably less reliable than adult tests of intelligence. Specific examples can be found in the Buros Mental Measurement Yearbook. The sixth edition[4] reveals, for example, that for the 1973 Stanford-Binet Intelligence Test, at higher IQ levels, average reliability coefficients are .83 for children aged 2.5 to 5.5 years but .95 for children over 14 years of age. The Peabody Picture Vocabulary Test has an alternate form reliability of .67 at age 6 but .84 at age 17. As a final example, the Bayley Motor Scale for infants has a split-half reliability of .68 at age 2 months but .87 at age 30 months.

The fourth analysis of reliability in terms of contributory background variables was by religion. In this case, differences between Catholics and non-Catholics were almost as striking as those between whites and nonwhites. Catholics responded with uniformly greater consistency to all parts of the questionnaire. To ascertain whether this apparent religious difference was in fact a racial one, since there were more black non-Catholics than black Catholics, the data were reanalyzed for white Catholics only. This analysis, which appears in the last rows of tables 4 and 5, shows that the differences are as large or larger than those for the total sample. Catholics, whether black or white, respond more consistently than do non-Catholics.

The literature is almost devoid of reliability analyses as a function of religious affiliation. One exception is Westoff, Potter, and Sagi's[6] 3-year followup study of family planning among white, married, adult women. In this study, Catholics reported least consistently on family-planning methods. Nevertheless, for various reasons the authors tend to discount this finding as representing more artifact than fact.

In the present study, however, the religious differences are both large and consistent and give every appearance of being real. What then accounts for them? From a psychological point of view, an interesting hypothesis can be advanced on the basis of Rokeach's analysis of authoritarianism.[7] Rokeach suggests that the Catholic Church represents an institutionalized form of authoritarianism, a trait that is manifested, among other ways, by approbation of tradition and discouragement of innovation and change. In the present context, these values are consonant with stability and consistency. Rokeach suggests that for persons high on the authoritarian dimension, not only is there institutionalized reinforcement for stable attitudes, but also the prospect of nonconformity, divergence, or change is anxiety producing. Notice that consistency, viewed from this perspective, is less a mark of virtue than we usually consider it to be.

Notice also that the greater consistency of Catholics attaches to reliability in *attitudes*. (For the questionnaire as a whole, 73 percent of the items were categorized either as attitudes or desires.) In the case of Ryder and Westoff's subjects, the comparison in which Catholics showed up as least consistent related to reliability and *behavior*. Further support for the Rokeach-based hypothesis would be forthcoming if empirical replication showed that Catholics are indeed more consistent attitudinally than non-Catholics but no more consistent or even less consistent than non-Catholics behaviorally.

SUMMARY

In summary, the present study has found that population questionnaire test-retest reliability does vary according to its content and psychological nature. The most important determinant of reliability in both cases appears to be the frequency of the respondent's exposure to the material when that material is of a cognitive nature. Another important determinant, especially in material that is less cognitively loaded, appears to be the degree to which the material is personalized (desires) rather than generalized (attitudes).

The study has also found that reliability does not vary as a function of some respondent characteristics but does vary as a function of others. Reliability does not appear to be differentially affected by sex, but is by age, race, and religion. There was no difference between male and female respondents in terms of reliability, whereas older respondents were more reliable than younger ones, whites more reliable than nonwhites, and Catholics more reliable than non-Catholics—at least where attitudes predominated in questionnaire composition.

Although the goal of the study was more to compare on a relative basis sources of reliability/unreliability than to measure reliability in terms of some absolute standard or against some arbitrary criterion, it must be noted that in terms of the statistic, measuring instrument, and sample used, reliability was low enough for some parameters to give population methodologists cause to consider. The very essence of population research is prediction, and the very backbone of valid prediction is reliability of the measuring instrument used for that purpose. It is not necessary to take the present results as indicating immutable or universal reliability values. It is necessary, however, to accept them as a demonstration that *assuming* reliability is not an acceptable substitute for its empirical proof.

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Appendix A

DEFINITION AND MEASUREMENT OF RELIABILITY

The definition of reliability of a measuring instrument is closely tied to the concept of error variance, that is, all uncontrolled sources of variance influencing the measurement of the variable under study. The true variance of the variable being studied is equal to the total variance minus the error variance. In referring to these three sources of variance, Cronbach[8] has used the analogy of a receiving apparatus (the test) that is trying to pick up a signal (the true variance). In the process, some noise (error variance) is also picked up. Reliability is thus defined as the ratio of true variance (signal) to total variance (signal + noise).

The three traditional methods of measuring reliability may be described as follows:[9]

1. *Split-half method.*—One test is administered. The test is then split into two parts that are statistically parallel with items of equal difficulty and equal variances. Typically, these halves are the odd versus even items of the test. The correlation between the two halves is used as an index of reliability. This method usually gives the highest estimate of reliability. It is most appropriately applied when the focus of concern is internal consistency.
2. *Alternate-forms method.*—Two separate, but statistically equivalent, forms of a test are administered to the same subjects. One may be administered immediately after another or there may be a short interval between tests. The scores from the two tests are correlated.
3. *Test-retest method.*—The same test is administered to the same subjects at two different time periods. The length of the test-retest interval must be sufficiently long so that the respondent does not remember his original answers. On the other hand, it must be sufficiently short so that the variable being measured has not changed over time.[d] A 1-month interval is frequently used between test and retest.

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[d] These considerations would suggest that Meltzer's and Hochstim's 1-week interval between test and retest probably produced reliability index values inflated by the factor of memory. On the other hand, the 3-year interview–reinterview data presented by Westoff et al. is probably more appropriately considered a followup study than a reliability study.

The test-retest method is appropriate when investigative interest focuses on trait stability. Stability is most often the focus of interest in population research, where one is concerned with long-term trends and future predictions.

The reliability of a test has typically been measured by correlating sets of test scores. Intuitively, the Pearson correlation coefficient can be related to the definition of reliability as follows: As error variance decreases, the correlation coefficient between sets of scores approaches ±1.0. However, for the kinds of surveys generally used in population research, each variable is measured by a single question rather than by a set of questions, as in intelligence tests. In other words, there is no range of scores, so that the correlation coefficient cannot be used. Therefore, it is necessary to assess reliability at the individual question level by some other statistical method.

The measure of reliability used in the present study is taken from Meltzer and Hochstim.[3] (The Meltzer and Hochstim index is conceptually the reciprocal of Ryder and Westoff's[1] coefficient of inconsistency.) In calculating this index, chance agreement is determined from the marginal distributions of a contingency table formed by crossing the test responses to a questionnaire with the retest responses to the same questionnaire. The resulting index represents the ratio of the difference between observed and expected agreements to the difference between maximum possible and expected agreements. When multiplied by 100, the resulting index value ranges between 0 and 100. A value of zero means that the only agreement between responses was that expected by chance. A value of 100 indicates perfect agreement, that is, maximum reliability. The formula is expressed as follows:

$$\text{Index of reliability} = \frac{\text{observed agreement} - \text{expected agreement}}{\text{maximum agreement} - \text{expected agreement}} \times 100$$

As an example of the way in which the index is computed, consider test-retest responses for a question used in the present study, Do you want to have children? for which the choice of answers was Yes, No, or Uncertain (table A1). The observed and expected agreements are those responses that were observed and expected to be identical for both questionnaires. These agreements can be calculated by summing the responses along the diagonal of the respective arrays. In this case:

Observed agreement $= 2 + 214 + 9 + 17 = 242$
Expected agreement $= .15 + 191.72 + .99 + 2.95 = 195.81$

In order to maintain the configuration of the marginals, maximum agreement cannot equal the total number of responses unless the marginals of the first and second questionnaire are identical. In all other cases, the lesser of the two marginals for each category

TABLE A1.—*Test-retest responses to question, Do you want to have children?*

Response	Response on first test administration				
	No response	Yes	No	Uncertain	Total
	Observed				
On second test administration:					
No response	2	4	1	0	7
Yes	4	214	8	6	232
No	0	4	9	2	15
Uncertain	0	16	1	17	34
Total	6	238	19	25	288
	Expected				
On second test administration:					
No response	.15	5.78	.46	.61	7
Yes	4.83	191.72	15.31	20.14	232
No	.31	12.40	.99	1.30	15
Uncertain	.71	28.10	2.24	2.95	34
Total	6.00	238.00	19.00	25.00	288

of response is used. Then, all are added together to give the maximum possible number of identical responses. For this example, the greater marginal for the first category (No response) is 7 and the lesser is 6, so that 6 enters into the computation. Similarly, 232 is smaller than 238, and so on, giving:

$$\text{Maximum agreement} = 6 + 232 + 15 + 25 = 278$$

These values are substituted in the above formula, as follows, to give a reliability index of 56 for this question:

$$\text{Index of reliability} = \frac{242 - 195.81}{278 - 195.81} \times 100 = 56$$

The principal advantage to the use of this index over a simple percent agreement measure of consistency is that it corrects for chance agreement. Such a correction becomes more important as the number of alternative answers decreases. Use of the index also presents advantages in situations in which a correlation might present an alternative. First, it can be used with nominal scales, whereas a product-moment correlation cannot. In addition, it makes the reliability of responses to all types of survey questions comparable, regardless of the number of alternative answers available or the scale of measurement used. Finally, it is not sensitive to skewness in the marginal distributions, as is correlation.

There are also disadvantages to the use of this index. Information is lost with interval or ordinal scales because the index is a qualitative one. That is, it measures occurrence or nonoccurrence of change in response, rather than quantity or extent of change. Also, the index varies with the coding scheme used. A coding scheme with narrowly scaled steps will show more test–retest disagreements than a coding scheme with wider scaling intervals, for example, age categories of 2 years as compared with 5 years.

Chapter 13

Values and Demographic Conditions in Attitudes on Population Policy[a]

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The two terms "family planning" and "population control" are often used interchangeably. The decision as to which term is used may depend on which of them seems to be more acceptable politically at the time. Each term, however, has its own separate meaning, its history, and its own appeal and outcome. These differences become important for questions of policy and program development: Should the focus of a policy be the status of the individual family and parent? Should it be the needs of the country or even the general problem of world overpopulation? Different professional and political groups promote programs for different reasons, but the aims of the policymaker may have little to do with the reasons why individuals practice contraception.

This paper will attempt to distinguish certain conditions under which different reasons for interest in population limitation develop. To do this, I shall concentrate on variables that predict answers to questions of concern with population growth (population control) and acceptance of contraception (family planning) in a variety of countries in different stages of development. People may look at family planning according to self-interest; in this case, their attitudes on this topic would depend on their social position and their needs. On the other hand, attitude toward population control may be said to be part of an ideology; in this, it should be related to attitudes and values on other topics.

We are investigating here the relationships among different sets of independent and dependent variables under different conditions. In operational terms, this means that we are comparing the regression coefficients of different independent variables within a country and among different countries, using a great number of surveys.

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THE REQUIREMENTS

The use of secondary analyses of a variety of studies presents several difficulties. One difficulty is technical: no two surveys are completely alike, and if one uses a great number of surveys, different procedures will be employed in sample design, question selection, and generally in the definition of independent and dependent variables. The second, perhaps more serious, difficulty is conceptual. A comparative theory can be stated in hypotheses relating the type of countries to events within the countries. A statement may be made: for example, "In a rapidly developing country, women working in industry will reduce family size." A failure to find this relation in a particular data set may show (1) that the hypothesis was wrong in its entirety, (2) that the part about the country was incorrect, (3) that the statement about the sector of the population was incorrect, or (4) that the variables—about the countries or within the survey—are badly measured. Correction may be needed at any of these points. In order to proceed through this maze in a reasonable way, the system of research will have the following characteristics:

1. It will consist of robust measures—namely, measures that do not depend on the exactness of the collection procedures—and the substitutions and comparisions of somewhat similar facts might be possible.
2. It must be a developing system studying both classifications of the countries themselves and the use of the variables within the countries.
3. It must be free in the methods used and opportunistic in using different statistical techniques that seem reasonable in making different relations explicit. In particular, it will combine clustering techniques with parametric correlational techniques, for it must build a scheme that will be open to addition of new sets of data for new countries and for new public opinion research data.

The scheme to be followed should start, therefore, with a classification of the countries, primarily through cluster analysis, followed by observation and reanalysis of surveys done in these countries starting with the set of the most comparable kind of data. Next should be a reanalysis of the public opinion data to get them into a scheme that seems to be reasonable as to the progress of the innovation, preparation of the scheme that can exhibit the relationship of these variables within the different clusters of countries, and finally rearrangement of the countries according to the newly found relationships to determine an empirical way of justifying the classification of the countries. This opens the way to incorporate a new set of data that can be fitted in the newly conceived scheme.

DATA USED

I shall describe some of the first steps in this scheme and show how a theory of conditions of population policies can be developed through the analysis of secondary data. The data were based on two sets of surveys collected in 1964 and 1965 through the U.S. Information Agency (USIA). The surveys contained questions on acceptance of the goal of population growth or decline and on acceptance of the use of birth control. Some demographic measures on class position, education, age, and sex were included in each survey. They also included some comparable attitude data, notably one set of questions relating to individual responsibility versus trust in public action. Another set of questions dealt with concern with different issues in the country. These questions were not identical, but after much trial and error, comparable data could be used in the following four classes: (1) two questions about social position (socioeconomic status and education), (2) two questions about personal position (age and sex), (3) one question on self-reliance versus depending on others, and (4) one or two questions on concern with problems of the country. These four sets of questions then could be used for differential prediction of the two dependent variables, that is, concern with population growth and acceptability of birth control.

CLASSIFICATION OF COUNTRIES

Classification of countries was based on a scheme developed for an earlier study.[1] In this study, data were collected on demographic, social, and political organizations of all the member countries of the United Nations. We found that several characteristics of the countries could be used to classify them into five groups, which distinguished the kind of report given in answer to a United Nations inquiry on population policy. For the purpose of the present study, we used a more formal computer technique of cluster analysis developed by Poss.[2]

Cluster analysis is a sorting based on internal criteria; that is, the structure of the data (in this case, the characteristics of the countries) is allowed to suggest natural groupings. The class of methods most suitable for this application developed mainly in pattern recognition research. These methods are alike in making use of what is variously called the mean-square distance, the least squares, or the minimum error algorithm. This algorithm proceeds as follows:

1. Cases widely distributed in the measurement space are selected as initial group centers.
2. The remaining cases are assigned to these centers in order to optimize a homogeneity criterion.
3. The partitioning is modified by an iterative procedure to optimize the criterion further until no improvement is possible.

The best number of groups to represent the data depends, of course, on the structure of the data. The technique, therefore, lets the data suggest the best number of groups. This is accomplished by comparing the change in homogeneity criterion as the number of groups increases with analytically derived results from a uniformly distributed data set in the same measurement space. A uniformly distributed data set will produce a smoothly declining patterning of the homogeneity criterion as the number of groups increases until the ultimate state of complete homogeneity is reached, where each case is a separate group. A structured data set, on the other hand, should produce a sharp drop in the criterion when a natural subgroup structure is found. Thus, the presence and nature of a subgroup structure is detected by comparing the rate of change in the criterion with the analytically derived rate of change for data uniformly distributed in the same measurement space.

The whole set of countries for which data were available were clustered according to two sets of criteria: demographic and economic conditions, and political and social conditions. In both, five clusters were determined. In the demographic-economic, the clusters ranged along a scale of social development from two clusters with a very low degree of industrialization-urbanization, but distinguished by population density and growth rate, through the developing countries to the current highly industrialized countries. The second set of criteria distinguished social conditions, primarily homogeneity and heterogeneity according to language, religion, region, etc., effectiveness of the legislature, and existence of an elite. A cross-break of these two sets of five clusters gives 25 groups, but in fact 9 groups had no representatives at all; thus only 16 groups remained.

In checking the countries for which there were data on the USIA study, a further simplification was made as there were only enough countries present to represent four clusters. The first included underdeveloped countries of Africa; the second cluster included countries in which development had started; the third cluster, in which the most data were available, included the developing countries of Asia, Latin America, and North Africa; and the last cluster included the developed countries such as Argentina, Japan, and Western European countries. For the first step of this study, we used those four groups to see whether there were any distinctions in the groups of countries according to rough groupings of conditions, leaving the more detailed clusters for later analysis with additional studies.

SURVEY ANALYSES

Within these countries the surveys were done through the USIA containing, as described previously, four sets of independent variables—social position, personal position, attitude toward personal responsibility, and importance of social problems—and two dependent variables—attitude toward population growth in general and toward the birth control policy. The next step was to construct an initial model of a pattern of relationships that relates the growth of public opinion on these topics to the social state of the country. As this is a secondary analysis of a set of studies not done for this purpose, it has just the bare data necessary to work on our problem. On the other hand, it is one of the few sets of data available that is consciously made comparable over a large number of studies. In a way, this gives us a skeleton scheme to propose a set of relationships into which we can fit later studies that are done in more detail on the problems of population control, but not with comparative data.

We started with analysis of different kinds, including cross-sorts and the Automatic Interaction Detector, a program developed at the University of Michigan. These procedures gave us some idea of the types of relationships to be expected and of special groups within the population of each country that are most extremely concerned in one or the other direction on these topics. There was a danger, though, that we might be swamped by the peculiarities of special groups of people. We therefore retreated to a scheme of looking at the seven independent variables by using a cumulative regression technique to compare the different countries. Under these conditions, we cannot expect that these variables will explain very much of the variance of the dependent variables, but we can compare the sets of variables for the different groups of countries and in this way get a picture of the meaning within the different clusters of countries.

A second analysis consists of using the multiple-partial coefficients as entries into an analysis of variance design; this summarizes and assesses the significance of the regressions. Taking each country as a subject, we have eight measures—the four regression coefficients for each of the dependent variables—for each subject. The subjects (countries) are grouped into four clusters, as described previously. We have thus a repeated-measures design with one variable between subjects (clusters) and two within subjects (four condition categories and two policy questions). Table 1 shows the outcome of this analysis.

The significant effects in this table are the three main effects. The variables as a whole do not predict as well in both the least and most developed countries, and they predict concern with population size better than interest in birth control. Among the predictors themselves, social position (socioeconomic status and education) is the strongest predictor, followed by personal position and the attitude sets.

These results show that the variables used—which are among those most commonly used in fertility surveys—are most effective in the developing countries—which are those where most studies have been made and from which most theory has been developed. In the underdeveloped countries, the issue is not salient enough, and in the industrial countries, other predictors may be more important.

Although there is a trend for the attitude items to be more important in the developed countries, the interaction of type of country with the other variables is not significant. Inspection of the data shows high variability within the country clusters, leading to the suspicion that important variables in country classifications were missed. One additional classification category that could be entered was Catholicism (defined as whether Catholics formed more or less than half of the

TABLE 1.—*Analysis of multiple-partial coefficients*

Source	*df*	*F*	Percent of total sum of squares
Cluster	3	[2] 3.535	7.09
Countries within cluster [1]	21		14.04
Policy attitude	1	[2] 4.398	.99
Cluster × policy attitude	3	1.987	1.34
Policy attitude × countries within cluster [1]	21		4.73
Condition	3	[3] 9.593	12.48
Cluster × condition	9	1.789	6.99
Condition × countries within cluster [1]	63		27.33
Policy attitude × condition	3	1.589	1.59
Cluster × policy attitude × condition	9	.812	2.43
Policy attitude × condition × countries within cluster [1]	63		20.98

[1] These effects were used in testing the preceding effects.

[2] $p < .05$.

[3] $p < .001$.

TABLE 2.—*Analysis of multiple-partial coefficients with Catholicism added to clusters*

Source	*df*	*F*	Percent of total sum of squares
Cluster (including Catholicism)	6	[2] 3.756	10.73
Countries within cluster [1]	18		8.57
Policy attitude	1	[3] 9.061	1.53
Cluster × policy attitude	6	[2] 3.207	3.24
Policy attitude × countries within cluster [1]	18		3.03
Condition	3	[4] 10.843	14.78
Cluster × condition	18	0.956	7.81
Condition × countries within cluster [1]	54		24.53
Policy attitude × condition	3	[2] 3.214	2.92
Cluster × policy attitude × condition	18	1.185	6.47
Policy attitude × condition × countries within cluster [1]	54		16.38

[1] These effects were used in testing the preceding effects.

[2] $p < .05$.

[3] $p < .01$.

[4] $p < .001$.

population). Using this variable to divide the clusters, we obtain seven country types (the type I countries were all non-Catholic). Repeating the analysis with these seven clusters (table 2), we get the same main effects, but, in addition, there is an interaction between type of country and the dependent variable—in the Catholic countries concern with growth was earlier to predict, and in the non-Catholic countries acceptance of contraception was easier to predict.

In a small number of surveys (seven), respondents' religion was assessed, and in these countries we applied regression analysis to see how Catholicism influences population policy attitudes. Of the seven countries, four were in the industrialized cluster, leaving only three in the other countries. In the latter three, Catholicism did not add particularly to the regression. In three of the four industrialized countries (England, Italy, and the German Federal Republic), Catholicism was a highly significant predictor of acceptance of contraception; in two of them (England and Italy), it predicted concern about growth. Only in France was Catholicism not important. Thus, religion seems to become an important variable in the developed countries, where attitudes in general tend to become more important.

A similar argument could be made for classifying countries along a political continuum; however, as no Communist countries were included in this survey, no such division of countries could be made. In a number of countries, however, attitudes toward the United States and the U.S.S.R. were assessed. Adding this variable to the regression produced no increase in predictability.

DISCUSSION

Let us summarize here what we have learned about concern with population problems in social development. At first it may be only a question of personal concern with little knowledge of means of contraception (cluster 1 countries). In the cluster 2 countries, we may say that the variables represent simply awareness of new methods and the possibility that policy could be executed and be successful. In these countries, a question of lack of knowledge of contraception may be the most important variable to consider in instituting a policy. When knowledge is more widespread, its efficient application becomes important. This will depend on subtle questions of attitude, position, and knowledge; beliefs become important. The countries in the third cluster are the most interesting to study in this respect. The distinction of relationships important for concern about population growth and birth control programs is significant here, and the varying effects of the different attitude measures show the intricacy of relationships in these countries. The addition of more data may be possible to define a series of clusters as stages of interest at this point. It is also remarkable that these are the countries, especially in Southeast Asia, in which population control policies have been most popular with the governments. These are also the countries in which most of the research on this topic has been done; most theory about population policy, therefore, is based on them. Finally, with the diffusion of population control in the general population, the questions of whether it should be done and of the control of the government and its importance in social policy become much more questions of general ideology than of knowledge and personal condition. In the last cluster, these may then become the important questions.

We have sketched here the first step in the technique to make it possible to control a wealth of data from many countries and to include many relationships to the variables in which we are interested. This would make it possible (1) to use secondary analysis for establishing general social theories, testable over a range of societies; (2) to avoid many dangers such as ecological fallacy; and (3) to prevent the researcher's being swamped in a wealth of data.

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Chapter 14

Psychological Determinants of Nuptiality[a]

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INTRODUCTION

Marriage, like any social phenomenon, may be studied from a variety of research perspectives. Once the phenomenon has been acceptably defined, it may be analyzed descriptively or analytically, it may be treated in the aggregate or by reference to particular cases, its causes or its consequences may be sought, and so on. Diverse research routes are both legitimate and necessary to gain insight into any social behavior as complex as marriage.

In demography, the study of nuptiality involves mainly the statistical analysis of incidence of marriage and age at marriage, by period or cohort and in relation to indices of social or economic position.

The determinants of nuptiality have generally been analyzed by sociological or anthropological perspectives; that is, elements of the society or culture have been viewed as exerting an influence on the statistical distributions and trends documented by demographers. Such influences include the legal codes or traditions governing age at marriage, the preference for open versus closed choice of partners within the cultural system, the strength of the bond between the marital dyad and the extended kin group, the impact of economic cycles, the availability of prospective mates (sex ratios, propinquity), the functions of marriage for perpetuating the social group and socializing its new members, the existence of norms and social roles that define adulthood in terms of marital status, and so on. These sociological and anthropological explanations of nuptiality pertain, quite appropriately, to aggregate levels of conceptualization and analysis.

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The psychological determinants of nuptiality, by contrast, should pertain to individuals rather than aggregates. Both the concepts and the research operations employed in a psychological context should refer to the person rather than the group, and should aim for an understanding of individual behaviors. This does not preclude, of course, the explanation of group phenomena by a psychological approach. It simply means that the theoretical and research perspective is directed consistently to the individual within the group.

With respect to nuptiality, a psychological approach would focus on the individual's decisions about whether to marry, when to marry, and whom to marry. With the behavioral event (decision) as a referent, the determinants of the decision might be investigated in diverse ways even within the field of psychology. A psychoanalytic approach would look for the ways in which marriage may recapitulate certain early childhood experiences or problems. A developmental approach would look for the meaning of the decision to marry in relation to the life cycle through various stages from infancy to old age. A behaviorist approach would focus on the contingencies for reward and punishment in the marital situation, in relation to the past learning experiences of the person and the behavioral routes open to choice. A social-psychological approach would look at the individual as a member of various groups, or as an aspirant to membership in certain groups, and would investigate the marriage decision in terms of both functions for group affiliation and the gratifications connected with the person's distinctive psychological characteristics. These sketches of psychological approaches are incomplete, but they may serve to illustrate the differences between psychological and other approaches, as well as to point out the diversity within the domain of psychology.

The perspective of this paper is social-psychological, both because that is the author's area of competence and because the approach of social psychology is more congruent with other work on nuptiality within the fields of demography, sociology, and anthropology. Writing two decades ago, Hajnal[1] noted:

> In spite of the huge volume of literature on marriage and the family, little attention has been devoted to the statistics, and little attempt has been made to explain the observed variations in the frequency of marriage and age at marriage. There is no well developed body of thought which could serve as a starting point for an explanation of the recent "marriage boom." [P. 88]

No doubt that statement is less true today with respect to the general development of work on determinants of nuptiality, but it remains essentially valid as far as psychological approaches are concerned. Substantial work has been done in psychology on the determinants of interpersonal attraction,[2,3] and other social scientists have dealt with the specific issue of mate selection,[4-6] but these efforts do not provide models that differentiate the influences on whether to marry, when to marry, and whom to marry. Those three aspects of marriage are intertwined, of course, but they probably should be treated separately with respect to determinants.

The aim of this paper is to suggest a conceptual scheme that may aid in the development of psychological research on nuptiality, particularly with respect to motivations for marriage and alternatives to marriage. Such research, it is hoped, would enrich the explanations of nuptiality that are offered at the aggregate level and also lead to better understanding and prediction by suggesting mediating mechanisms and accounting for individual variations.

In connection with the conceptual scheme advanced here, it will be pointed out that marriage and childbearing are firmly linked in the minds of many individuals, suggesting that explanations of nuptiality and fertility should be more closely aligned than they seem to be at present. Indeed, the conceptual scheme to be discussed will draw heavily from one recently developed in psychology to account for fertility,[7] and some examples will be cited from an ongoing study of motivations for childbearing.

A SOCIAL-PSYCHOLOGICAL APPROACH

Before presenting a conceptual scheme for psychological determinants of nuptiality, it is necessary to specify certain conditions under which it is meant to apply. As noted earlier, the general topic encompasses three different kinds of decisions: whether to marry, when to marry, and whom to marry. The approach described here applies more to the "whether" than to the "when," although in refined form it might be brought to bear on age at marriage, and it does not explicitly address the issue of whom to marry.

Because it deals mainly with the decision of whether to marry, this approach should be more useful when applied to relatively open marriage systems.[5] The emphasis on decisions necessarily implies a setting permitting some options and a degree of freedom of choice.

The scheme is meant to be adaptable for use in various cultures and for comparative studies. For that reason, the concepts employed are phrased in very general terms. The meaning of the concepts is made more specific by examples, but neither full descriptions nor operational definitions of the concepts are attempted in this paper. A summary of the conceptual scheme is shown in figure 1. A few comments about each of the categories in this scheme should clarify its intent.

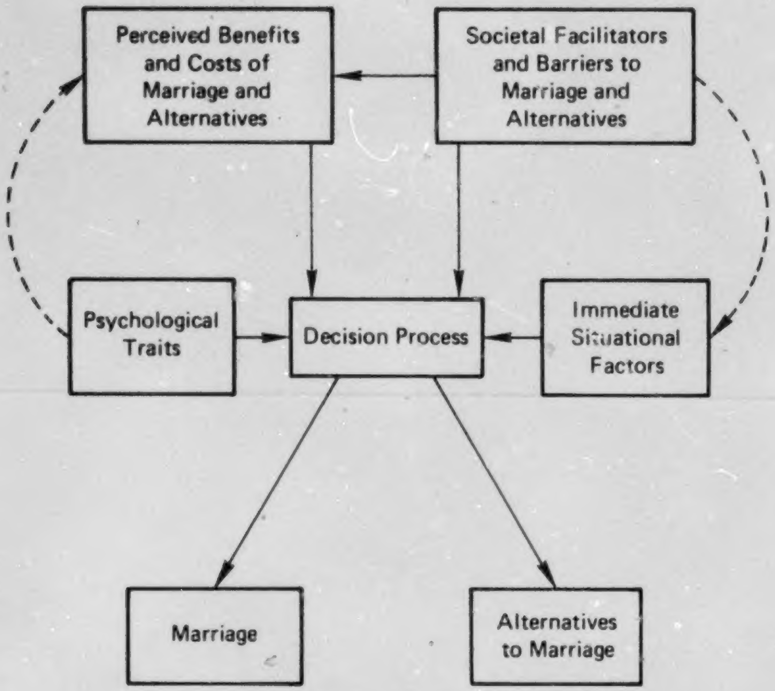
Perceived Benefits and Costs of Marriage and Alternatives
Societal Facilitators and Barriers to Marriage and Alternatives
Psychological Traits
Decision Process
Immediate Situational Factors
Marriage
Alternatives to Marriage

FIGURE 1.—Conceptual scheme.

The perceived benefits and costs refer to the extent to which marriage and its alternatives are perceived as fulfilling the psychological needs of the individual. Needs may be biologically rooted or derived from social experience. Perceived benefits and costs would each incorporate separate sets of concepts, as in the following examples pertaining to marriage:

BENEFITS

- Status and identity: Marriage as recognition of a person's adult status and confirmation of identity as a male or female in the husband/wife role.
- Emotional interactions: Marriage to provide close affectional ties and companionship with spouse and children.
- Childbearing and parenthood: Marriage as the legitimized route to procreation and perpetuation of the self.
- Sexual gratification: Marriage to provide a steadily available sexual partner.

- Group affiliation: Marriage as a means to solidify and extend the individual's kinship ties and for the individual to join the social network of the community or group.
- Economic gains: Marriage as a means to gain wealth and financial security through family affiliations or through group productivity and to obtain services expected from the spouse.

COSTS

- Loss of personal freedom and mobility: Marriage entails the commitment of self to others and acceptance of responsibility that may limit options for future action.
- Obligations and effort: Marriage may require the assumption of certain legal obligations and demand time and physical effort be expended on behalf of others.
- Economic losses: In marriage, earnings and wealth may be shared and thus to some degree not available for personal benefit.

Similar sets of perceived benefits and costs could be conceptualized and measured for various alternatives to marriage.

The societal facilitators and barriers are conditions external to the individual that affect access to marriage or alternatives. The existence of these facilitators and barriers does of course exert a strong influence on perceived benefits and costs, but the perceptions of any individual are only in part a reflection of the social conditions. Among the facilitators and barriers for marriage would be the following, most of which can be conceived as contrasting ends of a continuum:

FACILITATORS

- Customs and norms that encourage marriage and ease the decision to marry
- Societal nonavailability or unacceptability of alternative roles
- Unrestrictive divorce laws and customs, which have the effect of reducing the commitment in marriage
- Sexual restrictiveness, reducing ready access to partners outside of marriage
- Tax and welfare provisions that reduce the cost of marriage

BARRIERS

- Customs and norms that discourage marriage and impede the decision to marry
- Societal availability and acceptability of alternative roles

- Laws that make divorce difficult to obtain or require alimony and that have the effect of increasing the commitment in marriage
- Sexual permissiveness, providing easy access to partners outside of marriage
- Requirements for dowry or other arrangements increasing the cost of marriage
- Laws specifying minimum age for marriage or restricting choice of spouse, as with incest provisions

Psychological traits are the relatively enduring dispositions of individuals to behave in certain ways. These might include, for instance, propensity for risk taking, conservatism or traditionalism, impulsiveness, persuasibility, extraversion, and so on. In any particular case, the individual's pattern of traits is likely to affect his evaluation of the situation and his decision. Traits will also influence perceptions of satisfactions and costs of marriage and alternatives.

The immediate situational factors in the scheme refer to the particular setting in which the decision is taken. These might include influences from significant others, the availability of potential marriage partners in the locale, economic status of the individual, distance to the place where a marriage can be performed, and so on. The decision to marry in any particular case will be influenced by the constellation of situational factors operative at the time, as these factors are perceived by the individual. The immediate situational factors are in many cases closely linked to the more general societal facilitators and barriers.

The decision process itself involves the weighing of these various influences, although not necessarily at a conscious level or in a rational fashion. The outcome of the decision is to marry or to choose an alternative to marriage. The most likely alternative, of course, is to remain single, although other choices that might be considered as alternatives include communal living or group marriage. Remaining single could be, moreover, only the absence of a decision, that is, not deciding to get married. In other cases it could be an affirmative decision, for example, to stay single and pursue a career as an alternative to marriage. In still other instances, a decision may be made to get unmarried, that is, to become single through divorce or separation.

RESEARCH IMPLICATIONS

The conceptual scheme just presented is intended mainly as a heuristic device. It serves to point out some directions in which research on the psychological determinants of nuptiality might usefully proceed. It also suggests that such psychological research should not be conducted in vacuo, but rather linked in specified ways to other research approaches; for example, to the analysis of societal facilitators and barriers.

A priority area for psychological research is the topic labeled Perceived Benefits and Costs of Marriage and Alternatives. The subtopics given above as examples of benefits and costs seem readily amenable to psychological assessment procedures, and in some instances there is a clear connection with other levels of analysis. Perceived status and identity from marriage, for instance, represent in part internalized social roles. Perceived economic benefits and costs are presumably related to actual economic benefits and costs. Perceived group benefits should be linked to the family structure of the society, and so on. Research from this perspective should be complementary to other types of research and may be viewed as a way of converging, through diverse techniques, on true social behavior.

Research on perceived benefits and costs of marriage would also complement ongoing research that takes a similar perspective on children, with the aim of explaining fertility.[8, 9] It is of interest to note that some of the results of this research on fertility shed light on nuptiality; in the same way, research on psychological determinants of nuptiality would probably contribute to our understanding of fertility. Having children is not only one of the main reasons for getting married, but also for many people an essential part of the definition of marriage.

To emphasize this point, it may be helpful to look at some actual responses obtained in a study, carried out in Hawaii, of the satisfactions and costs of children. An open-ended question was asked as follows:

> Let's discuss your own personal feelings about reasons for wanting children. If you think about the comparison between having children or not having children, what reasons come to mind for wanting children?

Here is a sampling of the responses in which the respondents spontaneously linked children and marriage:

> They [children] are the main reasons for getting married. [Caucasian wife]
>
> It seems to me one of the only reasons for being married; in other words, that's what marriage is for. [Caucasian husband]
>
> It makes you complete as a person and it completes your marriage too. [Caucasian husband]
>
> I just never thought about no having kids—they just go with getting married and having your own family and being a responsible citizen. [Japanese husband]
>
> I think most men want children, that's what they get married for. [Japanese husband]

> To me something that is natural; you start out with getting married, you don't get married if you don't want any children. [Japanese husband]
>
> My religious feelings of wanting to complete our marriage with children. [Japanese wife]
>
> If you're married and not have any children, you'll be just fighting each other—husband and wife; what is a married life anyway without a child; why do they get married in the first place? [Filipino husband]
>
> Without children, a married life is not a family. Children make the family. [Filipino wife]
>
> After marriage, you should have children; children are part of our lives, having children and watching them grow. After marriage if you don't have children, there is no meaning of life. [Korean wife]

Similar results have been shown in other studies. Westoff and Potvin,[10] for instance, used the following item in a structured survey: Having children is the most important function of marriage. The results show generally high agreement with this item among American college students, as well as differences in level of agreement among religious subgroups. In Blood and Wolfe's [11] study, 27 percent of the sample rated the "chance to have children" as the most valuable aspect of marriage. Rainwater's[12,13] research shows further evidence of the linkage between motivations for marriage and childbearing.

Of course, this linkage is also reflected in the structural-functional approach to nuptiality, in which marriage is viewed as a major cultural mechanism for perpetuation of the group.[14] Psychological research of the kind discussed here provides a supplementary kind of evidence: marriage and children are functional not only for the maintenance of the group, but also are perceived by individuals as functional for their own psychological well-being (which is only partly a reflection of group structure). As such research progresses, and as the different kinds of functions served are delineated and compared across cultures, a fuller understanding of the trends and differentials in both fertility and nuptiality should emerge.

As noted earlier, a psychological approach may be more useful for explaining the decision to marry at all (whether) than for explaining age at marriage (when). A delineation of the individual's psychological needs as well as perceptions of the satisfactions and costs of marriage would help in understanding whether marriage fulfills important psychological functions for that individual and thus is likely to be sought. It could be argued that such an approach is relatively unimportant, since in most societies only a small proportion never marry.[15] Conditions are changing, however, and there are reasons to believe that the proportion marrying may decline as alternatives to marriage become more acceptable socially. In the future, then, an understanding of the psychological determinants of whether to marry may grow in significance.

Possibly social and economic variables are more efficacious than psychological variables for understanding age at marriage.[16,17] The decision of when to marry seems inherently less predictable as applied to individuals in an open-marriage system than the decision of whether to marry. Possibly the decision of when to marry is connected with the strength of the individual's needs that can be fulfilled by marriage, but certainly it is also affected significantly by situational factors that almost have the character of chance events. For example, the decision of when to marry is determined for many individuals by the circumstances of meeting the "right" person, defined according to a personal conception of the characteristics desired in a mate. These events do take place, however, within a circumscribed social and economic context that may provide substantial predictive power.

Two points should be made in conclusion. No simple scheme should be expected to emerge that will account for the psychological determinants of marriage. Rather, it might be hoped that a framework will be developed that can lend coherence to the diverse levels and kinds of motivations for marriage and contribute at least a small increment of understanding of this complex social behavior. For predictive purposes, such a framework might suggest typologies, or patterns of motivations, that have some predictive utility for aggregates as well as individuals.

Finally, it must be stressed that marriage has quite different psychological implications for men and for women in virtually all societies. While there may be a great deal of overlap between men and women in the types of motivations related to marriage, the strength of particular motivations is likely to vary [illegible] sex, and the consequences of marriage, such as changes in lifestyle, are very different for men and for women. It would be appropriate, then, to deal separately with men and women in research on the psychological determinants of nuptiality, although the conceptual framework guiding the research should encompass both.

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Chapter 15

Dynamics of Fertility Choice Behavior: A Pattern for Research [a]

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INTRODUCTION

The activities of the Cooperative Transnational Research Program in Fertility Behavior, coordinated by the Transnational Family Research Institute, are devoted to the development of psychosocial knowledge about fertility behavior on a worldwide basis. While the impetus for such research comes from the global concern with population growth, the basic aim of the studies performed is to understand and predict human behavior and ultimately to provide the means of ameliorating problems and enhancing family health according to the needs of individuals and families. This emphasis on the individual does not ignore the societal problems of overpopulation (or underpopulation); rather, it is our belief that optimal choice behavior by individual families will usually be consistent with optimal societal goals of population. A healthy couple relationship will not lead to an excess birthrate for a nation, but rather to a purposeful limiting of children to the number the couple wants. Such birth limitation will occur when the couple is not afraid of infant mortality and disease and povertystricken old age and when the opportunity to limit conceptions is made available to them when they need it, in a manner conducive to its use.

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[a] At the time this chapter was prepared, the Transnational Family Research Institute was affiliated with the American Institutes for Research. The origin and development of much of our thinking are the product of continuing interaction and exchange of ideas with our colleagues in the Cooperative Transnational Research Program in Fertility Behavior, located on every continent. We are greatly in their debt without, however, obliging them to accept all that we have proposed.

Our fundamental research orientation is that individuals are faced with many choice points and alternative courses of action that will determine the success of their efforts to control their own fertility. The awareness of those choice points, the extent to which alternative courses of action are recognized by them, and the degree to which their choices are based on realistic appraisals of the costs and consequences of those choices for themselves are the keystones of healthy fertility and fertility-regulating behavior. Public policies and their implementation; the provision of information, education, services, and products; and the social forces that encourage or discourage various alternatives are objective aspects of the environment that must be appraised by individuals along with their own psychic, sexual, and familial needs and desires. Changes in both individual outlook and public policies may be end products of intelligent research in this area. To achieve those objectives, it is our belief that research should emerge from a theoretical framework or the research in this field will remain formless, and research findings will often be ignored. There is a need for a theory of fertility behavior encompassing the factors that determine decisions leading to it. These factors are necessarily drawn from disciplines that include psychology, sociology, medicine, public health, economics, anthropology, and demography, but they are not the exclusive domain of these disciplines. Research efforts in the population field are often parochial because they are based on a set of hypotheses drawn from one or another of these disciplines. Since they all deal in various ways with human behavior, it is not surprising that each should have something to say on the subject of fertility; but it would be equally surprising if any one of these disciplines could say it all. The reason is a simple one: social, psychological, physical, economic, and other kinds of needs and motivations are integrated within the individual, but are isolated for perfectly sound research reasons in the disciplines that deal with them. Fertility behavior is a product of many forces. It is, however, a product expressed individually and is thus central to the psychological study of human behavior. Its understanding, prediction, and modification require an analysis of the environmental as well as the personal forces synthesized within the individual.

The question of how best to study this certainly does not yield only a single answer. We have attempted to address the question by separating out *what* needs to be studied about *whom* with consideration of *when* those studies can most profitably occur in relation to the timing of fertility behavior.

POPULATIONS, SAMPLING, AND THE TIMING OF RESEARCH

There are two facts certain about fertility behavior: (1) it involves two people and (2) it is subject to change over time. By ignoring these two facts, we run the risk of obtaining inconclusive results by confounding variables. The importance of both the couple and change is biologically rooted; it would be very surprising indeed if it had no meaning psychologically.

THE COUPLE

When we study fertility behavior, we are not considering only sexually reproductive behavior where the heterosexual couple is sine qua non, but many other kinds of behavior that may inhibit or facilitate sexually reproductive behavior. Nevertheless, in nearly all contexts, the individual's idea of his or her partner is of paramount concern. However clever we may be in unearthing valid information about knowledge, attitudes, and even individual practices of one individual, we may draw false conclusions about the behavior of this individual in conjunction with his/her partner and false conclusions, therefore, about how that behavior is determined and how it might be modified. For example, research (and common sense) has suggested that in many countries abortion is a topic about which men know less than women, and contraception is a topic that is discussed more freely by men than women; but what determines the occurrence of abortion or contraception is most likely the product of joint estimates of the consequences to the couple (even if the estimates are made by the individual alone). To take another example, one might learn from women in a given society that the pill seems to them to be the easiest, safest, and surest way to prevent an unwanted pregnancy and that they know where to get it and how to use it. From that we conclude that an even better distribution system will result in the vast majority of women using the pill. That might be true if women were not concerned about what their husbands want and believe and if their husbands held identical views. What we do know about men and women (if not about couples) in many societies is that they often have different views. While it is not always feasible to study both members of the couple at the same time, we can almost always learn what each individual believes about his/her spouse. We should be careful, however, not to substitute surveys of the views of men and women in general for information on the same topic derived from men and women in couples. It is not male or female profiles that are needed, but couple profiles.

The psychosocial model of fertility choice behavior emphasizes the subjective assessment of the environment by the individual and the importance of the two partners in a couple in determining each other's choice behavior. The implications of this model for research methodology may be summarized in the following points:

1. When possible, both members of a couple should be included in the research study. When it is not possible, it is important nevertheless that data about one individual's beliefs about the partner's views be solicited. Even when the "couple" to whom reference is made is (or was) a casual one, the respondent's view of the other individual will have played a major role.

A thriving academic pursuit—the cross-cultural study of marital power [1]—was deflated somewhat by Safilios-Rothschild's [2] disclosure that studies of conjugal authority, influence, and decisionmaking had rarely obtained data from both husband and wife. The necessity to query both partners about their perceptions of their relationship arises because of several now well-illuminated pitfalls: (1) power can be delegated and hence hard to trace; (2) the balance of power may shift from decision to decision and from one time to another; and (3) the importance of a particular decision is usually unequal for the partners and, indeed, one may willingly surrender power on several issues to gain control over another. Retrospective interview data can be obscured still further by the tendency for the person, considered to have the right to make a decision, to be remembered as actually having done so, even though this may not have been the case.[3]

Some contradictory findings concerning conjugal power—its sources and consequences—have given rise to doubts that a true picture of family decisionmaking can be obtained from self-report data, even when obtained from both partners. This skepticism has prompted the development of objective behavioral or observational methods.[3, 4] In spite of methodological flaws in individual studies, a "confirmation by consensus" is being achieved through the gradual accumulation of comparable findings on certain key points. The importance of shared power, flexible division of tasks, and a high level of communication in realizing effective fertility regulation has been repeatedly demonstrated. Mitchell,[5] for example, found in interviews with a large sample of husband–wife pairs in Hong Kong that unrestricted communication could partially override family and social characteristics that otherwise impede effective use of family planning. Further support for the Rainwater [6] conclusion that conjugal role segregation interferes with efficient contraception was reported by Stokes and Dudley.[7] Redefinitions by some younger women of the female sex role, especially with regard to occupational achievement, may be a critical factor influencing fertility differentials, as long-standing demographic predictors appear to be losing some of their discriminatory value.[8] Furthermore couple characteristics that are related to efficient contraception are also significant correlates of effective family health care and the use of preventive services.[9]

2. In studies of choice behavior, it is critical to know not only what is available in the environment for fertility-regulating purposes, but also, and even more critically, what the individual believes to be available. The openness of an individual to personally meaningful information about what is available in his environment can be constricted by a number of conceptually elusive, yet nonetheless potent, psychological forces. One of the most significant of these is the effect of alienation.

In two related studies, strong evidence has been found to support the hypothesis that alienation combined with social class more fully explained differences in the fertility of both Catholic and Protestant women than did social class alone.[10,11] Using a psychological scale that tapped three aspects of alienation (meaninglessness, powerlessness, and social isolation), the investigators discovered that the greater fertility of highly alienated women (compared with that of the less alienated) could be attributed to marriage at an earlier age, a shorter interval between marriage and the birth of the first child, and shorter spaces between subsequent births. In interpreting their findings, Groat and Neal[11] reasoned that powerlessness interferes with the learning of information directly relevant to one's personal well-being. Meaninglessness diverts attention from information necessary to make events intelligible and coherent. They concluded that—

> ineffective family planning may derive not only from a lack of knowledge or of access to methods, but also from the social psychological inaccessibility of "knowledge" generating a dominance of emotional over rational elements in the decision-making process. . . . Receptivity and successful use of information (i.e., rationality) are dependent upon subjectively held probabilities for a predictable and personally manageable social order. [P. 87.]

Further support for this position comes from a study by Bauman and Udry,[12] who found alienation to be strongly related to the regularity of contraceptive practice among married Negro males.

A sense of powerlessness about finding a viable alternative solution to one's precarious state is not conducive to long-term planning. In their study of economically entrapped coal miners in Great Britain, Hawthorn and Paddon[13] revived the old Yerkes-Dodson law from experimental psychology to explain the parabolic relationship between security and planfulness: Low or very high security will tend to make people either excessively anxious or excessively complacent; it is a very moderate amount that is most conducive to planning.

British coal miners were found to have a deeply ingrained habit of ignoring the future because they perceived no alternatives to their plight. They were afraid of death at work, losing earnings from injury or illness, potential insecurities in an unstable industry, and earnings gradually dropping away after the productive period of early manhood. Hawthorn and Paddon argue that planfulness, security, and orientation toward the future are all intertwined. The miners and their wives tended to think in terms of a weekly cycle rather than in terms of a life-span over a longer period. One direct consequence of this stunted temporal perspective, they suggest, was a high fertility rate, since effective contraception depends on planning, planning on motivation, and motivation on a well-formed and hopeful idea about the future.

3. The model implies the existence of choice, which in turn means that alternative courses of action were (or are) available to the individual. For dealing with this more narrowly focused aspect of fertility choice behavior, we have used (and modified) a schema taken from communication game theory to describe the components of choice. To understand and predict choice behavior we look to see (1) what alternatives are available in the individual's view, (2) what psychosocial costs are expected to be associated with the use of a given alternative, (3) how efficient the individual believes the alternative to be in achieving certain outcomes, (4) what outcomes the individual expects from each of the alternatives, and (5) what values are placed on those outcomes. This schema may be said to represent the "state of mind" of the individual about a given choice. As already indicated, data are needed for both partners and what they believe to be each other's state of mind.

A cyborgian relative to our approach to fertility choice behavior is Consumenoid I, a computer model of consumer choice behavior, undergoing development by a group supported by the Advertising Research Foundation and led by Martin Starr[14] of Columbia University's Graduate School of Business. While intended primarily to account for paradoxes of consumer purchasing patterns (e.g., brand switching), the model has design features applicable to fertility choice behavior. The decision theory on which Consumenoid I is constructed can be subjected to the same argument raised against all rational theories of fertility behavior: people do not calculate the answer to the question of whether they should have a child. Usually, they do not even ask the question. But, as Hawthorn and Paddon[13] have observed, "something less than clear and explicit intention and more than utterly fatalistic acceptance of nature does inform most people's perception of their fertility. Few people have no preferences at all" (p. 612). It is this thin edge of preference that formal choice theories seek to use.

Consumenoid I is an attempt to construct a decisionmaking system that acts as the average consumer does—consistently most of the time but erratically some of the time. Central to the theory is the concept of entropy, a measure of the perceived structure of available alternatives—goods to buy or actions to carry out—from which the model must choose. Consumenoid is in a state of maximum entropy when it perceives a large variety of equally desirable choices; this is when its purchasing pattern is likely to be erratic. It is in a state of minimum entropy when it perceives only one good choice, and then its buying pattern is likely to be stable and predictable. But the basic drive of Consumenoid is not to maximize or minimize entropy. Instead, it is to achieve, in the words of Starr,[14] "a dynamic equilibrium produced by seeking to effect the greatest change in structure possible per unit cost of available energy" (p. 11).

One of the most important elements in Consumenoid's decision mechanism is the planning horizon—how far into the future it looks to evaluate its choices. As has been already indicated, individual differences in planning horizons is a variable of increasing interest in psychological and social research, and it is strongly implicated in fertility behavior. More than a dozen recent studies have shown that objective measures of time perspective differentiate cross-culturally among socioeconomic classes and between psychodiagnostic categories.[15–18]

In fertility research, there is accumulating evidence that the planning horizon is a characteristic of effective users of contraceptives in Mexico,[19] Korea,[20] and among urban black males in the United States.[11] It seems likely that temporal perspective is closely linked to another ubiquitous variable in family-planning research, the modernism–traditional continuum.

4. Because choice points lie in a branching chain, a key feature of successful planning by the couple is likely to be their ability to foresee future outcomes, plan ahead for them, and have contingency plans available. The greater the projection into the future and the greater the detail associated with it, the more likely the couple is to achieve their goals.

An important advance in understanding and measuring the concept of planning behavior occurred with Hill's[21,22] research into the management of family resources. Three hundred families (including 100 young marrieds) were interviewed four times during the course of a year about planning and actions in eight areas of concern: (1) the choice of a place to live, (2) how to decorate and furnish the home, (3) how to remodel it, (4) which major home appliances to purchase, (5) which car to buy, (6) how to strengthen their financial position, (7) whether to change jobs, and (8) whether to continue to support the education of a family member. Measures were developed to define and describe four dimensions of what Hill termed "consumership":

a. Planning (the number of different plans formulated, the length of the planning horizon, the number of plans developed with specific time schedules or deadlines)
b. Efficiency of the decision process (the extent of information seeking regarding costs and alternatives, the amount of consideration given to short- and long-range consequences, the degree of couple communication about plans, the formulation of policy guidelines for family decisionmaking)
c. Planfulness of actions taken (the number of actions taken, the number unplanned or preceded by a plan, the number postponed or carried out on schedule)
d. Satisfaction or dissatisfaction with the outcomes

Several findings are pertinent to the present argument. There was persuasive evidence to support the contention that rationality acts to increase satisfaction. The efficiency with which couples made their plans was strongly linked to the level of satisfaction experienced with the final outcome, while unplanned, impulsive action tended to give rise to dissatisfaction. Actions that were carefully planned and actually carried out according to a specific time schedule were typically short term in nature. Long-term planning and successful implementation were not very frequently found. And the prospect for plans being formulated and carried out according to design varied inversely with the length of marriage. Couples married only a few years tended to be ineffective planners.

Another study of planning and time horizon[23] confirmed what had already been known from earlier research: the length of a man's time horizon and his willingness to plan ahead were related to his age, education, and income. But, more interestingly, they were also associated with higher levels of achievement orientation. There appears to be a dynamic developmental pattern in which those who are more achievement-oriented plan more, hence are more successful, have their achievement orientation reinforced, and plan ahead still more in a mutually reinforcing system.

5. The position of the couple in their overall fertility career is also highly critical. Subjects ought to be selected not on a random basis, which is likely to lead to the confounding of a variety of different factors in fertility behavior, but rather on their position in their fertility careers, for example, at the beginning of a permanent sexual union, before the first child is born, when spacing between children is wanted, at the end of the desired number of childbirths, etc.

This was the strategy followed in the study of newlyweds conducted by the National Institute of Mental Health.[24] The sample consisted of about 2,000 couples whose names were culled from Washington area marriage license records. Among the selection criteria was the requirement that wives were not knowingly pregnant as of 3 months after marriage. Couples were initially interviewed during the fourth month after marriage. A smaller group of 50 couples underwent more extensive interviewing and assessment with experimental interaction procedures.[4] Couples in this subgroup who had a child during the period of the study were seen again during pregnancy and in the first few postpartum months. Followup information has been obtained in some cases as long as 8 years after marriage.

On the basis of these data, a transitional process model was constructed to describe the several rites of passage young adults may experience: courtship, marriage, childbirth, death of a parent.[25] In each of these transitional events, there are changes in interpersonal ties.

The creation or destruction of a structurally distinct social unit is difficult, if not impossible, to reverse. From the point of view of the couple, marriage is a joining event and divorce is a separating event. Childbirth is a joining event from the point of view of a parent-child dyad, but not from the point of view of the husband-wife dyad. Each partner's passage through the separating or joining experience consists of a series of five steps that precede and follow the transition event itself. The steps are hypothesized to be the same, regardless of the nature of the transition. From the standpoint of research method, it is obvious that the detection and confirmation of this pattern required that all the couples in the sample be in the same starting position.

OTHER COUPLES

So far we have discussed the couple as though we were dealing with a married couple, but the concept of couple also applies to young, single people throughout the world. For example, girls are sometimes reluctant to use a contraceptive because of what their boyfriends might think of their sexual preparedness; abortions are delayed, with grave consequences, because a girl is not certain as to whether her boyfriend will marry her; young men are sometimes careless in using contraceptives because value is attached to the demonstration of "manliness" that impregnation brings. These considerations, and others like them, can be vital in fertility-regulating behavior. Researchers studying single people cannot afford to overlook the importance of the couple.

In addition to the importance of the nature of data we can derive from the study of couples, there is a significant methodological advantage. We are often dealing with data that are sensitive, private, ambiguous, seemingly irrational, and complex. We are very often without any kind of validity checks of the verbal reports. By gathering data from different sources about the same phenomena, we are in a stronger position to validate our findings. Studying couples acting together is a very difficult, though by no means impossible, task; but it is relatively simple to learn, independently from each partner, what each partner believes and what each thinks the other believes. This four-way scrutiny provides us with a measure of the concordance of views and the accuracy of mutual perception. As we shall see later, this a cornerstone of the methodology called for in the psychosocial model of variables.

Finally, while we have talked about the couple as the male and female sexual partners, and this is certainly the central couple in fertility research, the importance of the assessment of other people's views is frequently a vital factor and sometimes so important that it may be useful to consider a different kind of couple. This may be especially relevant in studies dealing with the nature of the communication that takes place between a woman seeking information and a family-planning worker, or a pregnant woman and the abortionist she finds. When such interactions are key determinants of fertility-regulating behavior, we feel that the same principle of gathering data about the same phenomenon from more than one source has equal validity.

CHANGE

Nothing is more obvious than the fact that through the life cycle the conditions of fertility change—biologically, socially, and psychologically. Yet, we have not granted sufficient importance to the interaction of these factors with fertility behavior. Recognition has certainly been taken of the beginning and end points of the fertility career by the many studies that, for example, deal with women at risk or women in their fertile years. In many other studies, cross-tabulations of related aspects such as parity or age are used, but these are essentially demographic rather than psychosocial variables. Roughly speaking we can divide the fertility career into the following three phases: (1) postpubertal, but prior to the stage at which children are desired; (2) active fertile years when children are desired; and (3) premenopausal years when children are no longer desired. While it is not always easy to identify the borders of these three stages for all individuals, it is feasible nevertheless to draw samples that will, for the most part, fall into one or another of these three stages. Populations of the young unmarried, the young married, and the older married form three natural groups for the initial selection of samples in a two-stage process whereby samples in different psychosocial stages of the fertility career can be defined.

In addition to the long-term sequential change in the fertility careers of couples, it is important, especially for methodological reasons, to identify the position of the woman, particularly in the short-term procreational sequence. The timing of a study may intervene at a time when (1) a couple (or respondent) is not sexually active, (2) the woman is sexually active but physically incapable of becoming pregnant, (3) the woman is sexually active and one or both partners is using a contraceptive device, (4) the woman suspects she is pregnant because of a missed menstrual period, (5) the woman knows she is pregnant, (6) a decision has been taken to bear the child, (7) a request for an abortion has been made, (8) the abortion request has been granted, and (9) the abortion request has been denied. Respondents in family-planning studies will fall somewhere along this continuum, and the nature of the current condition is very likely to affect responses, particularly to attitudinal questions. Abortion data are particularly sensitive to this topic, and the nature of the response likely to be elicited from the same woman when she is not pregnant and when she is pregnant with an unwanted pregnancy are likely to be different, at least in degree if not in kind. This, of course, can be turned to the researcher's advantage as, for example, by seeking a population of abortion requesters, or a group of women who cannot be pregnant because of a recent childbirth, but it should not be ignored.

To reiterate briefly, we suggest that when samples are selected for purposes of obtaining data about the psychological dynamics of fertility behavior, the couple, identified in terms of their fertility career stage and their current position in the procreational cycle, forms the soundest basis for selection. (See figure 1.)

THE NATURE OF THE DATA

From the two major premises of our approach, that two individuals in interaction form the basis for fertility (or fertility-regulating) behavior and that the biopsychosocial phase they are in changes over time, it follows that after selecting and identifying our respondents in their situational aspects, we need to obtain data about how decisions within these groups are made. This presupposes a third premise, namely, that choice behavior in fertility matters is a reality and that our most important role is to uncover the dynamics of choice behavior in order to understand, predict, and, in certain circumstances, be prepared to modify it.

No one should underestimate the complexity of fertility choice behavior. The factors that contribute to a given behavior are varied and, as noted earlier, form the subject matter of several different scientific disciplines. However, we feel that the psychologist has a key role to play because it is his job to study the synthesis of environmental aspects, which expresses itself in an individual's subjective appraisal of his needs and ultimately forms the basis for his choice of fertility-

Long term fertility career stage	Short term procreational phase											
	No contraception	Effective contraception	Missed menstruation	Pregnancy suspected	Menses induced	Pregnancy confirmed	Legal abortion requested	Legal abortion denied	Illegal abortion sought	Current Abortion	Current childbirth	Currently child offered for adoption
Menarche												
Single												
Engaged												
Newly Married												
Married with no child, Wanting children												
Married with no child, Not wanting children												
Married with children, Wanting more												
Married with children, Wanting no more												
Divorced or Widowed												
Remarried												
Approaching menopause												

FIGURE 1.—Suggested sampling considerations.

related behavior. In looking at the ingredients of his choice behavior, it is the opinion of the authors that the most useful psychological research will deal with those factors that are not only significant, but also mutable. Many studies throughout the world have taught us that, in general, the educated, well-to-do, younger urban couple living in a modern society will be most interested and most successful in family planning. Psychologists concerned with population research cannot make people educated, rich, young, or urban or change their society into a modern one. What they can do, however, is identify those dynamic factors that are characteristic of these conditions and that lead to the free choice of voluntary family limitation, which is characteristic of these groups. It is the contention of the authors that the major factors contributing to that free choice are neither immutable (or difficult to change) levels of socioeconomic class nor immutable deep-rooted personality characteristics, but rather are the mutable styles in which the same environmental fertility-determining factors are assessed, combined, and acted upon successfully by one group and unsuccessfully by another. It is the nature of these data that we consider to be the prime content for psychological research.

A PSYCHOSOCIAL FRAMEWORK FOR CHOICE BEHAVIOR DATA

In 1971, Jean Kellerhals, a sociologist at the University of Geneva, assisted the authors in developing a schema for describing the nature of the data most salient in psychosocial fertility research. During the past 4 years, the framework has been used many times in the development of research studies and has benefited enormously from inputs of colleagues in the Cooperative Transnational Research Program in Fertility Behavior. A description of the major categories of variables follow, with no attempt, however, to single out those variables within categories that are most significant in any given culture.

The model calls for the measurement of five major categories of variables: I. An objective description of the environmental factors including the socioeconomic position of the couple in their society, the surrounding human environment of the couple, and the availability of fertility and fertility-regulating services; II. The perception and evaluation of the factors in I as they positively or negatively affect fertility decisions; III. Selected individual's descriptors of each partner, including fertility circumstances and history, aspirations, dependence, and fertility state of mind about the other; IV. Concordance and the accuracy of mutual perceptions; and V. The couple relationship descriptors including stability, fertility communication, and fertility decision authority. A schematic representation appears in figure 2.

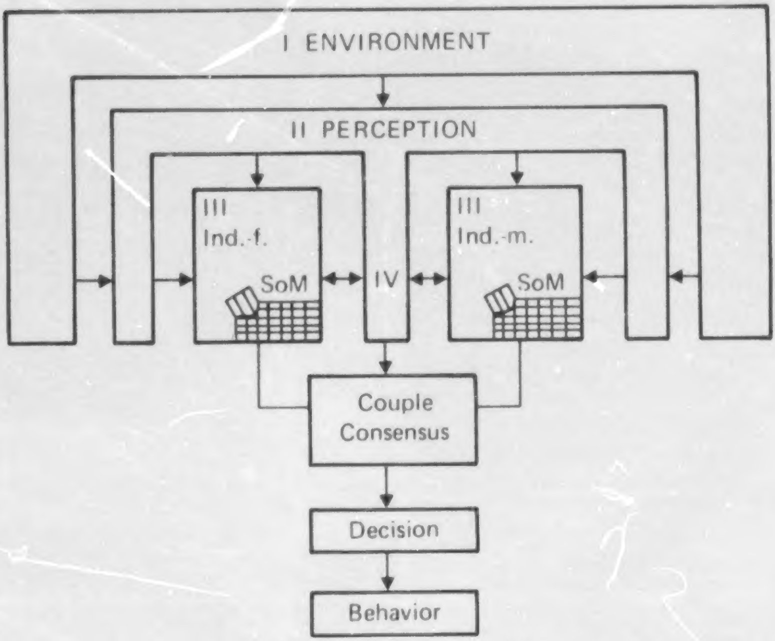
I ENVIRONMENT
II PERCEPTION
III
Ind.-f.
SoM
IV
III
Ind.-m.
SoM
Couple Consensus
Decision
Behavior

FIGURE 2.—Psychosocial model.

- I. Environmental descriptors
  - A. Situational variables:
    - 1. Marital status:
      - *a*) Married:
        - (1) Type of wedding:
          - (*a*) Civil
          - (*b*) Church
          - (*c*) Both
          - (*d*) Consensual union (common law)
        - (2) Living with spouse
        - (3) Separated for personal reasons
        - (4) Separated for other reasons
      - *b*) Single:
        - (1) Engaged to be married
        - (2) Currently in steady relationship with one partner
        - (3) No steady partner
      - *c*) Divorced:
        - (1) Currently in steady relationship with one partner
        - (2) Currently not in steady relationship with one partner
      - *d*) Widowed:
        - (1) Currently in steady relationship with one partner
        - (2) Currently not in steady relationship with one partner
      - *e*) Duration of current relationship
    - 2. Marital history:
      - *a*) Previous marriages
      - *b*) Date(s) of marriage(s)

  - *c*) Duration of marriage
  - *d*) Reasons for marriage termination
3. Age and age of spouse
4. Education:
   - *a*) Level
   - *b*) Type
5. Religion:
   - *a*) Theological affiliation
   - *b*) Church's position
   - *c*) Religious practice
   - *d*) Agreement of partners
6. Material conditions:
   - *a*) Per capita income
   - *b*) Distribution of earnings in family
   - *c*) Regularity of income
   - *d*) Number of sources of family income (regular employer or multiple sources)
7. Dwelling circumstances:
   - *a*) Space
   - *b*) Privacy
   - *c*) Technical standard (quality)
   - *d*) Household equipment and furnishings
   - *e*) Who lives in household (family and others)
8. Employment:
   - *a*) Current training activities (potential employment)
   - *b*) Type and level of job
   - *c*) Hours of work and regularity of working hours
   - *d*) Transportation facilities to and from work
   - *e*) Continuous or seasonal
   - *f*) Location of job (at home or away)
   - *g*) Partner's employment
9. Availability of domestic help:
   - *a*) Available child care (presence or near location of parents or other relatives)
   - *b*) Accessibility of nursery school or kindergarten to place of residence or employment
10. Social origin:
    - *a*) Rural/urban
    - *b*) Level of parents' education
    - *c*) Employment of parents
    - *d*) Presence or absence of both parents during childhood
    - *e*) Number of siblings (age range, position)
    - *f*) Migration during childhood

B. Fertility:
1. Circumstances:
   - *a*) Number, age, and sex of children living
   - *b*) From which marriage of which partner (if not from both partners of current marriage, and where and with whom have children previously lived)
   - *c*) Stillbirths and infant mortalities, approximate dates (also births of malformed infants)
   - *d*) Abortions, both induced and spontaneous, approximate dates
   - *e*) Previous contraceptive activity

2. Consequences of childbirths/abortions:
   - *a*) Physical (health effects, if any)
   - *b*) Material (effect on job or dwelling space)
   - *c*) Social (effects on social activity)
3. Current availability of fertility services:
   - *a*) Contraceptive information
   - *b*) Contraceptive supplies
   - *c*) Abortion legality
   - *d*) Abortion services
   - *e*) Prenatal care
4. Sexual behavior:
   - *a*) Frequency
   - *b*) Regularity
   - *c*) Timing
5. Potential:
   - *a*) Presence of sterility in either partner
   - *b*) Ability of woman to bring pregnancy to completion
   - *c*) Ability of couple to bear healthy child
   - *d*) Danger to mother's health of childbearing
   - *e*) Potential of multiple births
   - *f*) General health status

C. Human environment:
1. Nature of most frequent contacts in relation to fertility matters:
   - *a*) With whom: family, friends, colleagues, neighbors
   - *b*) Type of contact and degree of intimacy:
     - (1) Professional (e.g., with colleagues, clergy, medical, social services)
     - (2) Social (e.g., parents, family, friends, neighbors)
   - *c*) Frequency of contacts regarding subject matter

II. Subjective assessment of environmental factors

III. Individual psychological characteristics

A. Aspirations in regard to—
1. Standard of living:
   - *a*) Financial
   - *b*) Material
   - *c*) Leisure activities
2. Education and training
3. Employment
4. Marital relations
5. Parenthood
6. Children's futures
7. Personal freedom/responsibility in relation to partner and family

B. Certain personality characteristics:
1. Dependence/independence
2. Conformity
3. Modernity
4. Internal/external locus of control
5. Dominance/submissiveness

C. The state of mind in regard to fertility decisions

IV. Concordance and the accuracy of mutual perception

V. The couple relationship

A. Fertility-related communication in—
1. Sexual behavior
2. Potential childbearing

    3. Fertility regulation:
        a) Contraception
        b) Abortion
    4. Childrearing responsibilities
B. Planning behavior in—
    1. Childrearing
    2. Future living circumstances
    3. Future employment
C. Locus of authority:
    1. Sexual initiative
    2. Fertility-regulating responsibility
    3. Employment or education of woman
D. Marital satisfaction:
    1. Sexual matters
    2. Childrearing
    3. Standard of living of family
    4. Woman's activities

CATEGORY I

The major objective of obtaining data about the variables of category I is to identify the possibilities of choice behavior to which the individual is exposed. It goes without saying that to the extent that samples are selected on the basis of some of the above variables, as recommended earlier, the variable becomes redundant. Thus, a population of newlywed couples, married for the first time, eliminates many questions subsumed under "marital status." Information about the availability of fertility-regulating services should be obtained, for purposes of this category, not from the couple but from environmental sources. The data in this category are meant to be objective data, providing descriptors about environmental facts and current and previous circumstances. It will certainly be true that not all variables listed above will be relevant for a given population, not only because some are redundant but because some are culturally inappropriate. It should be borne in mind that the main criterion for inclusion is relevance to the *particular fertility decision or behavior* under study. Thus, information about the human environment is sought in order to determine the relevance of questions about positive or negative pressures and assistance by the people in close contact with the respondents. Information about employment could be sought mainly to determine the likelihood of actual disruption that a childbirth, for example, might have on the current employment of the respondent. In this manner, what appears to be a long list of variables rapidly narrows down in the construction of a questionnaire, or the structuring of an interview.

CATEGORY II

While in category I the principal concern is with environmental facts, category II focuses on an even more critical determinant of fertility behavior: the subjective assessment of these variables as they are perceived in relation to fertility choice behavior. In the final analysis, people act on their beliefs and assumptions about the world, and in order to measure the impact of environmental factors on behavior, we must have adequate knowledge about their evaluation of such factors. Within each of the categories of variables outlined in category I, there are parallel judgments made about their importance to a given fertility decision.

For example, if the objective of the research study is to focus on a decision to seek an abortion or to carry a pregnancy to term, questions about dwelling circumstances will deal with the anticipated effect an additional child will have on dwelling space. Questions dealing with the abortion law will relate to the respondent's belief about what it is and how or whether it is likely to be enforced; questions dealing with religion will ask the respondent to state what position his or her church has taken on the issue, whether he or she agrees with it and accepts it as binding, etc.

As always, the specific objective of the study will direct the researcher to explore the specific interactions between the environmental descriptors and positive or negative influence perceived and the strength of those influences on the decision.

CATEGORY III

Category III, which normally forms the mainstream (together with sociodemographic descriptors) of data sought by psychologists in population research, is treated somewhat differently here, in that we give only slight attention to deep-rooted personality characteristics and major attention to what is described as the state of mind of the individual in regard to fertility decisions. There are several reasons for this approach. First, remembering that two individuals form our unit of research and that situational factors, most particularly the stage in the fertility career, play a dominant role, it is our feeling that most personality measures will have only little causal relationship to actual fertility behavior. Second, personality measurement is a difficult, time-consuming task, which is highly vulnerable to cultural differences. The development of measures that are valid, let alone cross-culturally equivalent, is in itself a formidable task. Third, for practical purposes, the focus of much research must be on mutable factors, and personality variables are certainly not readily among those. That is not to say, however, that our approach is less psychological. It is rather

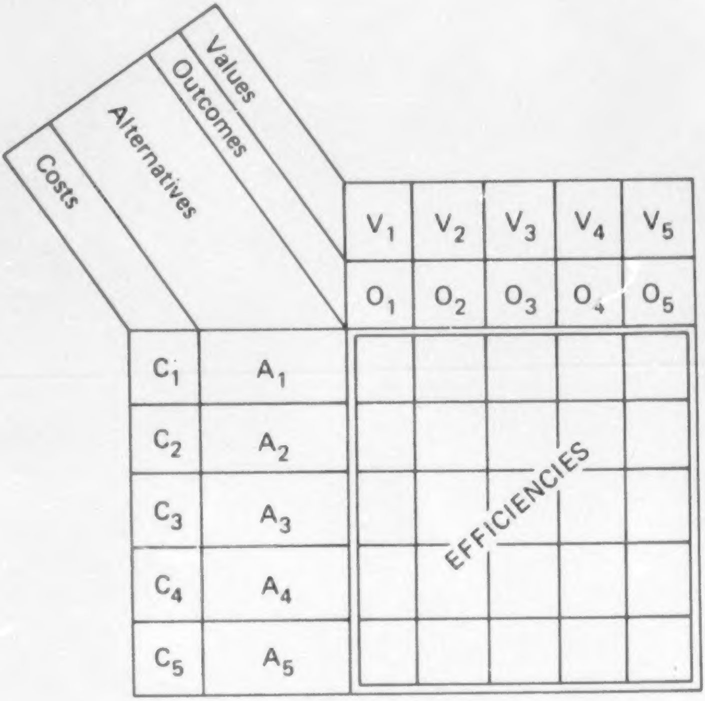

FIGURE 3.—State of mind.

that our focus is on the patterns of cognitive and affective factors that dominate a given behavioral situation and that are, we believe, both better predictors of behavior and more accessible to modification.

Some individual characteristics have achieved wide acceptability, however, as predictors, and they are included in category III. We recommend obtaining individual psychological data on variables A and B.

Variable C—the state of mind in regard to fertility decisions—lies at the heart of our research approach in that we feel it is the most direct route toward the understanding of the dynamics of fertility choice behavior. It draws heavily on a model derived from a communication theory first put forward by Ackoff,[26] but is, in its present form, quite different. What follows is a description of major components of choice behavior and the relationship in which they can be analytically reviewed. It is not a description necessarily of how the decision is formed. We believe an identification of these components and descriptions of how they are related to each other by the individual will demonstrate different patterns in which these components are synthesized by indi-

		OUTCOMES		
		Seek or accept risk of pregnancy (O_1)	Seek to temporarily prevent pregnancy (O_2)	Seek to permanently prevent pregnancy (O_3)
Costs	Alternatives	Value 1	Value 2	Value 3
C_1	Seek to plan jointly with partner (A_1)			
C_2	Go it alone in making plans (A_2)		EFFICIENCIES	
C_3	Wait for partner to make plans (A_3)			
C_4	Postpone any effort to plan (A_4)			

FIGURE 4.—The state-of-mind matrix for the childbearing decision.

viduals. Furthermore, we believe that fertility choice behavior may ultimately be modified both by the manipulation of the components themselves and the manipulation of the ways in which they are related to each other.

The state of mind is conceived as a condition in which an individual wants something but has unequally efficient ways of obtaining the desired result. Any single state consists of five interrelated elements: (1) the alternative courses of action the individual believes to be available to him at that time, (2) the psychosocial cost of each alternative composed of negative concomitant aspects of the alternative, (3) the possible outcomes that might result from each alternative as conceived by the individual, (4) the relative value of each outcome to the individual, and (5) his subjective estimate of the likelihood that following a particular course of action will lead to a particular outcome. Three of these elements—costs, values, and estimates of likelihood—are quantifiable, scalable variables. They are displayed in figure 3.

To more fully illustrate the state-of-mind concept, figure 4 depicts the state of a person who is poised at the beginning of a long chain of decisions about childbearing. At this entry point, the choice concerns the allocation of personal power; that is, which one of the married partners is to formulate the plans and make the decisions about the bearing of children? The alternatives that confront the individual at this critical decision node are listed in the matrix. Each has its own price, defined as the expenditure of personal resources required to carry out a particular course of action plus its negative (in contrast to its positive) consequences. The person must estimate the psychosocial cost—both to the self and to the marital relationship—of assuming a posture of dominance (A_2), acquiescence (A_3), postponing action (A_4), or of seeking an egalitarian sharing of power (A_1). The range of possible outcomes and corresponding values for this set of alternative courses of action is also found in the matrix.

While a given state of mind is static, in two senses it leads into the future. First, outcomes literally place the individual in a new situation in which new choice behavior becomes possible. Second, the individual at the time of choosing may project into the future both the choices facing him in the new situation, if his behavior succeeds, and those facing him if it fails. The extent of a person's foresight has been designated as the planning horizon in several theories of consumer behavior and has been found to be a significant determinant of effective decisionmaking. The chain of matrices branching from two of the outcomes in figure 4, seeking to permanently or temporarily prevent pregnancy, is schematically represented in figure 5. Each state of mind results from the outcome of a preceding choice.

It is our contention that the major intervening, that is, psychosocial, variables that causally relate such factors as socioeconomic class to successful fertility-regulating behavior are to be found in the category of variables depicted in figure 5. They include the recognition of fertility choice points, the realistic awareness and assessment of the state-of-mind components individually, the relating of those components to each other, the visualization of the new state resulting from the successful outcome of their choice, and the visualization of the new state resulting from the failure of their choice. It is our view that once a population for study in a specific cultural setting is defined and isolated as described earlier, the fundamental dynamics of choice behavior can be uncovered by focus on these variables.

CATEGORY IV

Just as we have indicated that environmental factors need to be considered in the light of individual perceptions of them, so must the actual state of mind of the partner be identified by the respondent.

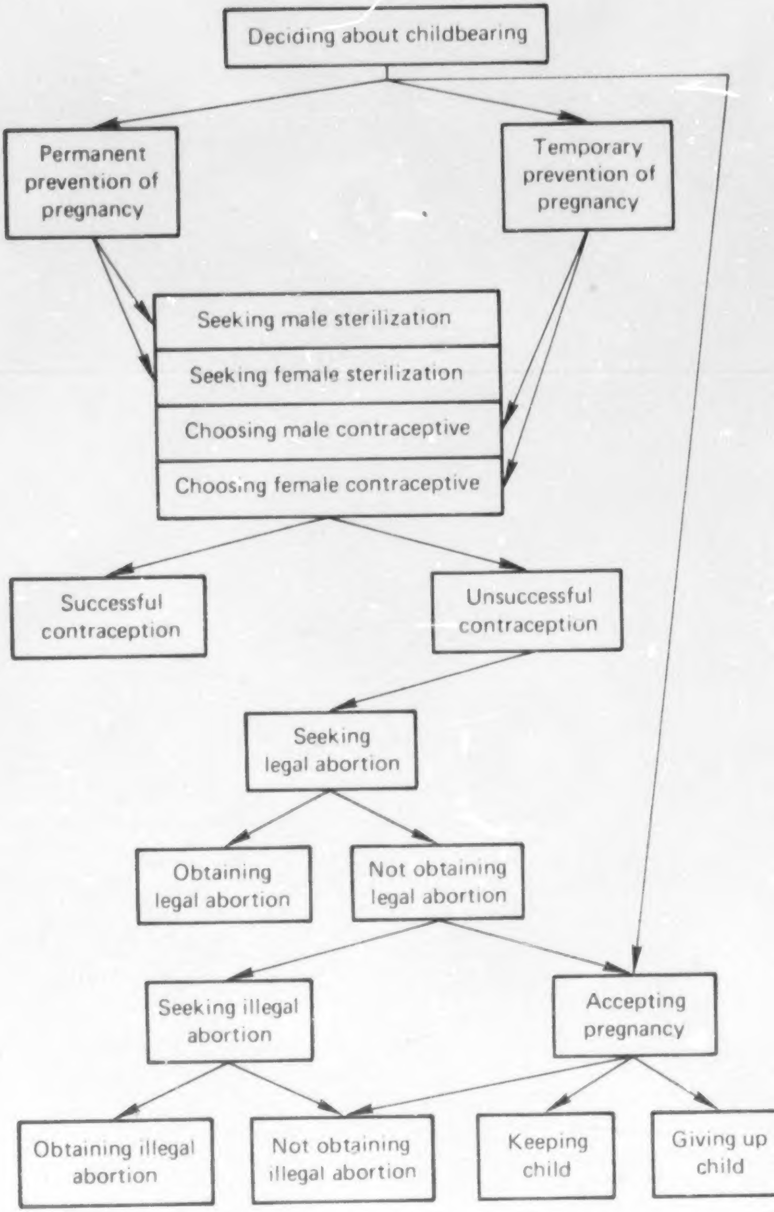
Deciding about childbearing
Permanent prevention of pregnancy
Temporary prevention of pregnancy
Seeking male sterilization
Seeking female sterilization
Choosing male contraceptive
Choosing female contraceptive
Successful contraception
Unsuccessful contraception
Seeking legal abortion
Obtaining legal abortion
Not obtaining legal abortion
Seeking illegal abortion
Accepting pregnancy
Obtaining illegal abortion
Not obtaining illegal abortion
Keeping child
Giving up child

FIGURE 5.—Sequential matrices of states of mind.

Since the unit of study is the couple, we suggest that data in regard to the state of mind be drawn independently from each partner about himself/herself and what each believes to be the partner's state of mind. In doing so, the researcher is automatically provided with a four-way comparision enabling him to measure the degree to which the components of the partner's state of mind match each other (concordance) and the degree to which they are correct in their beliefs about their partner's state of mind (accuracy of mutual perception).

CATEGORY V

As detailed as the psychosocial model variables may appear to be, they are designed in such a way that they are obtainable from independent interviews of the sexual partners and do not require actual couple observation. The value of the data will depend heavily on the manner in which the population for study is defined, and on the timing of the research with respect to the short-term procreational phase of the couple. In keeping with this procedure, we suggest in category V that data about the couple relationship be obtained from each individual separately, thereby avoiding the complex problems of observing couple interaction and at the same time gaining a kind of validity check on statements about the couple relationship. Much has been made of the importance of communication between the partners. In fact, it is the end product of that communication in regard to fertility matters that is at issue. For couples who are in agreement and know each other's views, communication about fertility-related issues may be unnecessary, and any measure of either quantity or quality of communication on that subject may be misleading. For couples who are not in agreement or are mistaken about each other's views, as would be determined in category IV variables, the need for communication becomes apparent. Another aspect of great importance is the locus of authority in the family, that is, in whom does the ultimate power reside in regard to fertility-related decisions. Third, the aspect of marital satisfaction in general, as well as in regard to fertility matters, is also important, since it may serve as a key to predictions of the stability of the relationship. We suggest data be derived from the partners on the variables A–D.

SOME ADDITIONAL METHODOLOGICAL CONSIDERATIONS

So far we have discussed concepts of whom to study when and what sort of data are most needed. We would like to add to this four methodological considerations of paramount importance in fertility research.

THE NEED FOR TRANSNATIONAL RESEARCH

The facts that the population problem is so urgent from a societal point of view and the freedom to manipulate the environment so limited from an experimental point of view place immense importance on the community of psychologists to take advantage of natural experiments by using culturally different conditions. With careful consideration of the selection of populations within different cultures that are comparable to each other on the psychosocial dimension of self-selecting fertility career stage characteristics, transnational studies can be mounted measuring the impact of cultural features of the environment that exert different kinds of pressures on couple fertility choice behavior. This enables the researcher to collapse in time the accumulation of needed data. It is not only our belief that it is feasible, but in many respects this paper is the result of a such transnational efforts.

BEHAVIORAL VALIDATION AND PROSPECTIVE STUDY

As noted at the beginning of this paper, we strongly feel the need for research to proceed from a sound theoretical base if the cumulative impact of research is to be felt. To develop fertility theory requires not only the generation of testable hypotheses that are related to each other, but their validation by behavioral measures. To do so requires prospective studies done over time in which some possibility of establishing causal links between certain psychosocial factors and behavioral events can be made. This procedure is essential if we are to progress in our ability to discriminate valid from invalid causal relationships and, ultimately, build theory.

CHANGE AND THE NEGLECTED MINORITY

In many of our sociological and psychological studies, when we draw conclusions about the majority behavior in the populations under study, we tend to forget or ignore the deviant behavior of minorities in our samples. For some fertility research objectives, it is sometimes the minority that should interest us most. Patterns of fertility behavior along with sexual behavior, the role of women, and family structures are changing rapidly throughout the world. Nevertheless, if we were to look, for example, at a newlywed population in a developing country, we are likely to find that a majority do not actively plan to limit their family size early in their marriage. We are also likely to find that a minority do and that that minority is growing. What makes that minority differ from the majority when their cultural milieu and their socioeconomic characteristics do not is a subject of great relevance to the dynamics of fertility behavior in a changing world.

MUTABLE VARIABLES AND THE MODIFICATION OF BEHAVIOR

In category III-C of the psychosocial model described above we dealt with the state of mind of individuals in regard to fertility decisions and in category IV with the partners' concordance and the accuracy of their mutual perception of these states of mind. The variables contained within those categories are primarily mutable variables that can be subjected to change by a variety of public and private means. The choice points available to the couple—the awareness of alternatives, the realistic assessment of the cost of those alternatives, the adjustment of subjective probabilities about the likelihood of consequences of methods to objective realities, the awareness of outcomes, and the capability of planning with these components in mind for possible success or failure of the alternatives chosen—can be modified far more readily by education directed at specific subgroups than can environmental, sociodemographic, or deep-rooted psychological variables. It is our contention that the understanding, prediction, and modification of voluntary behavior can best be met by dealing with these ingredients of the dynamics of fertility behavior.

FERTILITY CHOICE BEHAVIOR AND THE PROVISION OF ALTERNATIVES

Finally, while we have stressed the couple as the primary source of data, discussed how such populations might most fruitfully be identified and sampled, focused on their perceptions of the world around them, and considered how their behavior might be modified by alterations in those perceptions, we must also recognize that when fertility-regulating behavior is decided on, a significant factor in the successful outcome of couple choice behavior is the behavior of those providing services, products, or simply information. Health, education, and welfare service providers are also in the domain of the psychologist in search of the dynamics of fertility behavior and need to be studied as the middlemen between individual choice and public policy.

SUMMARY

It is the broad contention of this chapter that there is an urgent need for psychologists to pursue research leading to a clearer understanding of the dynamics of fertility choice behavior. There are three main reasons for this: fertility choice behavior is (1) the major causal factor of the population crisis, (2) modifiable, and (3) a proper and important subject matter for psychologists as scientists of human behavior.

This paper makes recommendations in regard to how populations for study might be defined, the timing of research in relation to the short- and long-term stages of the fertility career, the nature of data that need to be collected, and the methodological factors in the design of research. In brief, we recommend that the couple be the primary unit of research, that populations for study be defined on the biopsychosocial dimension of stage of the fertility career, and that the data to be collected fall into the following five categories of variables: (1) certain environmental factors as objectively measured, (2) some of those same factors as perceived by the respondents, (3) some individual characteristics focused primarily on the individual's state of mind in regard to specific fertility decisions (including (a) the awareness of alternatives, (b) the psychosocial costs assigned to them, (c) the belief about the likelihood of certain alternatives leading to certain outcomes, (d) the identification of those outcomes, and (e) the values placed on them; the nature of those data is to be taken in the framework of a chain of eventual new states, and the major concerns in that regard are with the presence of planning for success or failure of behavioral choices), (4) the concordance between partners and the accuracy of their mutual perception, and (5) certain characteristics of the couple that relate to communication, division of responsibilities, locus of authority, and satisfaction together.

We suggest that such data can be derived independently from each partner, or minimally from one, including data about the partner's beliefs, and that it is not essential (although certainly desirable) to observe couple interaction in vivo. The more precise defining of the populations for study reduces the very large number of variables that would otherwise need to be considered, and the research consequently becomes both easier to manage and more sure of conclusive interpretation.

The possibility of defining populations for study on the basis of self-selecting biopsychosocial dimensions makes cross-cultural comparisons more meaningful, and we urge that they be made because of the tremendous gain to be derived from the natural experiment of diverse conditions throughout the world, when the urgency of useful findings is so great. The thinking presented in this paper is in fact a product derived from the interaction on a transnational basis of social science researchers and encourages us in the belief that such studies are feasible. The widely held view among our colleagues is that while cultural and environmental factors differ, principles of the dynamics of choice behavior are held in common. It is those principles that must form part of a theory of fertility choice behavior and, in a classical pattern, the development of new hypotheses for behavioral testing. We urge, therefore, the development of additional transnational prospective studies of fertility choice behavior at different stages in the fertility career and in interaction with different kinds of service and information providers, and that whenever possible, they be done on a prospective basis so that behavioral tests of the validity of hypotheses become possible.

Finally, as behavioral scientists, we wish to emphasize that the study of fertility dynamics is of profound importance for theoretical as well as practical reasons and that the science of psychology has much to gain from its pursuit.

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PART III

Educational Issues

Chapter 16

Developing Psychologists for Work in the Population Field: Workshop Report[a]

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PURPOSE OF THE WORKSHOP

For several decades, there has been an intensive search for explanations, prediction, and regulation of population phenomena. The discipline most central in research and study on population has been sociology-demography. Predominantly, the focus has been on numerical assessments; rates of population growth and decline, migration, and differential fertility across national and cultural groups have received a great deal of attention. Only recently have other disciplines recognized that such phenomena deserve consideration from the perspective of their own disciplinary concepts and by means of their unique methodologies.

Surprisingly, despite the fact that the entire realm of population study is predominantly focused explicitly on human behaviors, psychology has been very slow to recognize population as a legitimate research and content focus, or, in fact, to perceive the psychological nature of the questions put by members of other disciplines seeking an understanding of population behaviors. Nevertheless, there is almost no question focused on by population researchers that should not be of crucial concern to psychologists. In terms of fertility behaviors, a sampling of questions suggests the need for extensive and intensive psychological attention; for example, Why do people have excess fertility? What is the meaning of children to parents? What are the alternatives to childbearing (such as careers for women)? How does unwanted childbearing affect parents, siblings, and the child? Why do people select a certain contraceptive—or refuse all? How do people respond to appeals for changes in family size? Who influences family size? In the investigation of almost any population issue—migration, environmental situations (such as crowding), infant mortality, or any of the vast range of concerns—psychological antecedents and consequences deserve attention. Theoretical and research focus on such phenomena should be seen not merely as a response to societal and scientific needs, significant as these are, but, more important, as legitimate and enduring concerns of psychology and of all behavioral sciences, whether or not a population crisis is perceived to exist.

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[a] The workshop was sponsored by the American Psychological Association Task Force on Population, Family Planning, and Population Policy, and by the Center for Population Research of the National Institute of Child Health and Human Development. The sponsors wish to express deep appreciation to the distinguished participants who contributed so much time, energy, knowledge, and ability to fulfilling the purposes of the workshop. Special thanks are due W. Grant Dahlstrom, who served so ably as chairman of the workshop. A list of participants is furnished at the end of this paper. Thompson and Newman have presented a brief report of the workshop.[1]

The reasons why psychologists have delayed in integrating population study in their teaching and research are no doubt multiple and varied. It may be that there is simply a lack of knowledge among psychologists of the breadth and depth of the population field and of the explicitly psychological dimensions involved. Such a lack of awareness certainly would preclude the extensive and intensive focus required for developing an adequate substantive basis for the incorporation of population in undergraduate or graduate education in psychology. The result has been that, to this point, psychology students (and thus emerging psychologists) have not been trained to perceive population phenomena from a psychological perspective or to study them by psychology's laboratory, clinical, and field methods.

A workshop entitled "Developing and Educating Psychologists for Work in the Population Area," held at the University of North Carolina, October 24–26, 1971, was sponsored by the American Psychological Association (APA) Task Force on Population, Family Planning, and Population Policy, and by the Center for Population Research of the National Institute of Child Health and Human Development. A major purpose was to develop plans for enhancing the focus on population psychology in academic settings, in order to prepare emerging psychologists for research, teaching, or administration in the area of population psychology.

A number of psychologists currently engaged in research and teaching in population and several departmental chairmen or representatives of departments with interests in population participated in the workshop.

FRAMEWORK OF THE WORKSHOP

Because of the dearth of population material in the education of psychologists, it was necessary to consider not only the entire college-university educational process, but also postdoctoral education. Thus, the workshop focused on developing ways of (1) encouraging and stimulating students in undergraduate psychology courses (especially psychology majors) to consider population as an interesting, productive, and socially significant area in which to develop a career as a psychologist; (2) motivating graduate students to prepare for a career in psychology, with special emphasis on future work in the population area as a professor, researcher, administrator, or any combination of these; and (3) attracting psychologists to postdoctoral education to obtain the background that would enable them to make optimal use of their psychological expertise in population research and teaching.

Basic to all discussions of developing psychologists for population work is the expectation that each department of psychology will consider these matters in the light of its own program content and goals, as well as of the resources and objectives of the university.

POSTDOCTORAL EDUCATION

Although it is the last level of the educational sequence that begins with the undergraduate, postdoctoral education offers the most rapid and expeditious way of supplying psychologists desperately needed for population teaching and research. Psychologists with varying degrees of knowledge of population, from none to some, could obtain 1 or 2 years of postdoctoral education in population. Psychologists considering postdoctoral education might avail themselves of opportunities to discuss such training with psychologists and others already in the population field. This training, tailormade to suit their needs, could best be taken at a university population center or in a department having the appropriate personnel and facilities.[b]

While the postdoctoral education should lean heavily on sociologists and demographers, who are likely to have basic population knowledge and methods, and on psychologists with a population background, such an educational experience should certainly be interdisciplinary. Thus, the postdoctoral student should also plan to draw on population specialists from disciplines such as economics, anthropology, political science, public health, and reproductive biology. A psychologist with 1 or 2 years of such intensive postdoctoral education in population should then be competent to conduct population research and to begin to build courses and course sequences that would provide an integrated focus on population psychology.

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[b] A list of population centers may be obtained from Planned Parenthood—World Population. *Directory of Population Research and Study Centers in the USA, 1972-1973.* Rep. No. 104, New York.

Because of the urgent need for population psychologists, condensed postdoctoral education—for example, 4- to 5-week intensive summer programs—is being considered. Such programs would be offered to members of other disciplines (e.g., economics, anthropology, sociology, political science, and geography) as well as to psychologists. To be maximally useful, the program should offer all participants a core course in social demography, the area in which the fundamental population issues and the majority of population research have been centered. The major component of such an intensive program, however, would be a comprehensive, population-focused course in the participant's own discipline. Part of the goal for each participant would be to develop a research project or a population psychology curriculum for his institution. Such an intensive summer program would provide interaction among members of various disciplines, such that the psychologists not only would be prepared to provide basic population teaching and research in population, but also would be attuned to the complex interdisciplinary nature of population issues.

UNDERGRADUATE EDUCATION

Population research, training, and administration draw on a number of disciplines, including the biological, biomedical, behavioral-social, and mathematical-statistical sciences. Thus, preparation for work in population requires the same broad intellectual and scientific foundations necessary for all scientific work. The background requirements are similar, and the education of a population psychologist, judiciously managed, should prepare the student for broad basic competence as a psychologist, with the capacity to apply his education to diverse behavioral and societal issues.

The means of developing a population focus in psychology are varied. Population might be included as a topic in a basic course (as in introductory psychology) or as an area of social application of psychological concepts in others. The nature of such focuses would depend on course content and instructional goals; a few examples follow.

POPULATION TOPICS IN PSYCHOLOGY COURSES

General. Introducing population to psychology students could begin as a topic included in introductory courses. This framework would establish population as a necessary and legitimate area for psychologists to study and would also encourage student interest in such social problem areas. Such an introductory focus might require that textbooks contain sections or materials concerning population phenomena and issues; most introductory texts do not now contain such materials. While psychologists have not yet produced a large body of research and theory in the population field, there is a sufficient amount of relevant material from other behavioral-social sciences that can be used to begin to place population more firmly in psychological teaching and research.

Introductory course. Briefly, in the introductory course, three approaches to population could be used. The first approach would consider reasons why psychology should focus on population; the second would pertain to the application of psychological methods and theories to population; and the third would use population as an exemplar of social-behavioral issues that might confront the psychologist. The three approaches are indeed complementary; while alluded to here as the means of considering population in a basic course, they are also the approaches that might be used in focusing on population in other psychology courses, with more details and complex handling as course level and content alter.

Course specializations. There is a wide range of course and programing specialization in psychology. There are the broader areas of clinical, developmental, experimental, quantitative, physiological, and social; and there are more specialized courses in such areas as adolescence, attitude theories and measurement, learning, perception, personality, small groups, and tests and measurements. In all courses and areas, certain population topics and research approaches to these topics would be salient. Individual teaching and research styles would greatly influence the nature and degree of focus. For this reason, only brief examples relating to certain areas are provided to delineate possibilities for integrating population into psychology courses and curricula.

Clinical. In the clinical area, population topics might be a part of certain course or topic considerations, or these could be expanded to the point of a total course on such topics as psychodynamics of family planning and contraceptive behavior; psychodynamics of abortion and sterilization; family dynamics and women's roles; and clinical practice in such areas as family planning, contraception, abortion, and sterilization.

Developmental-child. In the developmental-child area, population phenomena of concern may already be a part of a course or courses. Examples of such issues are the origin and development of reproductive and contraceptive behavior and attitudes; effects of child spacing, family size, and familial sex composition on child development; reproductive and contraceptive behavior, and out-of-wedlock births, during adolescence; origin and development of motivations for and alternatives to parenthood. Developed more fully, these concepts might result in a very sound theory-research course.

Experimental. A number of experimental psychological concepts also have relevance for population. Some of the major issues in this area pertain to the means of acquiring and modifying behaviors. For this reason, focuses on behavioral modification and a clarification of the reward-punishment dimensions in, for example, incentive and other policies for affecting population growth are dual concerns of experimental psychology and population. Theoretical and experimental approaches to such phenomena as motivation, perception, cognition, and decisionmaking, as these relate to reproductive and other population behaviors, are legitimate concerns of experimental psychologists. Because many experimental psychologists have become involved in the application of such concepts to social problems, population might well fit into this general approach.

Social. Social psychology courses could discuss such matters as (1) social, economic, ethnic, educational, and political factors that contribute to and are also consequences of various population phenomena such as reproductive behavior, migratory behavior, urban behavior, and density; (2) attitude theories and methodologies with respect to family planning, contraception, and abortion; and (3) socialization processes, interpersonal influences, social comparison and reference groups, and similar considerations related to the development and maintenance of reproductive and other population attitudes and behaviors. In experimental social psychology, major contributions to the population field would result from the application of laboratory methods in performing studies that would require large expenditures of time and money if research were to use field experiments that may be less amenable to controls. For example, laboratory studies could be conducted on such problems as (1) assessment of attitudes toward diverse population phenomena, for example, family planning, family size, and contraceptive behavior; (2) assessment of social-psychological mediators of such attitudes and of behaviors such as migration and policy opposition; and (3) designing and assessing the effectiveness of communication and other programs directed at effecting change in diverse population attitudes and behaviors. Experimental laboratory research (combined, where feasible, with field research) for exploring such issues would use and expand extant theoretical concepts. Thus, both theoretical considerations of and research on crucial population questions should fit into existing courses. Further, because there are social-psychological factors involved in all population behaviors, theoretical and research considerations of the wide range of population issues provide sufficient content for one or more courses.

Physiological. In physiological psychology, as well as in experimental and developmental psychology, there are a number of population issues of explicit concern. The psychobiology of reproductive behavior; the role of growth, endocrinological, and nutritional factors in such behavior; and the effects of reproductive behavior on growth, neurological, and endocrinological factors are illustrations of population subjects that are central issues in these subareas.

Quantitative. Quantitative psychology also has a unique set of research methods and analyses that are highly applicable to population. Developing psychometric models of population growth and changes using decision-tree models in studies of family size, applying unfolding techniques to perception of various size families, and cognitive mapping of concepts relating to population are all possible and legitimate concerns of quantitative psychologists. Further, because quantitative psychology is content free (in terms of the material that may be assessed by the diverse methods of concern), teaching quantitative methods with a focus on population questions is entirely feasible.

More specialized courses. In all the more specialized courses cited earlier, population issues are of concern and could be a major focus. For example, in courses on personality, motivation, and tests and measurements, both the important issues of consideration and the measurement of personality and motivational issues in population could be integrated into conceptualizations and research focuses of the academician.

POPULATION PSYCHOLOGY COURSES

Any psychology department that considered population important could offer at least one undergraduate course, perhaps at an intermediate level, in psychology and population. Such a course could present a systematic integration of the concepts, theories, methods, and findings of psychology in relation to important population phenomena. Among the topics considered would be reproductive behavior; fertility regulation, contraception, and family planning; population distribution, including migratory behavior, growth of cities, and density factors; and population policy, with its psychological, social, political, economic, and ethical implications. If departments wished to give greater emphasis, a more advanced course, or series of courses, in population psychology also could be given.

An undergraduate course (or courses) in population and psychology would indicate to the student the department's interest in population. It would also provide students with a more systematic, integrated picture than they could obtain from discussions of population topics in the various psychology courses, as important as these discussions are, and would help to satisfy the great and growing interest of psychology undergraduate students in population.

INTERDISCIPLINARY UNDERGRADUATE EDUCATION IN POPULATION

Since population studies involve a number of sciences, a well-selected interdisciplinary program would probably constitute the best undergraduate preparation for population work. Such a program would be perfectly feasible for a psychology major, if the departmental requirements are sufficiently flexible and the student is carefully advised. That is, while concentrating in psychology, the student could also be aided in selecting a well-integrated set of courses oriented to and supporting of the population field. For example, the student could take several traditional psychology courses, such as developmental, social, and experimental design, and some advanced-level psychology courses relevant to population, such as a population psychology seminar, individual reading and research courses in psychological aspects of population, and honors work with focus on some psychological issue in population. The majority of related courses might be selected from areas such as sociology (demography and family sociology in particular), anthropology, political science, economics, statistics, and city planning. The rest might be chosen from such areas as zoology, reproductive biology, and public health. With such a background, the student could enter graduate school in psychology or another population-oriented discipline, where his strength in psychology should affect his future education and his career. If the student terminates at the bachelor's level, he or she should be more prepared to fill a position in the population area.

GRADUATE EDUCATION PROGRAMS

Much has been said about the possible contributions of psychologists to the population field. Such statements are based on the assumption that psychologists acquire capabilities and characteristics that enable them to make contributions to population studies that are different from those which other behavioral-social scientists can make. Such capabilities might include the special theoretical and empirical subject matter of psychology, which emphasizes understanding the behavior of individuals, both as individuals and as interactors, and understanding human groups in terms of both individual and larger aggregate factors. The psychologist emphasizes such matters as—

1. The development of precise and testable theories
2. The necessity to test theories and hypotheses by accurate, quantitative empirical methods
3. Sophisticated, quantitative methodologies and techniques
4. Highly developed statistical and mathematical methods of data analysis and synthesis
5. Parsimonious and logical interpretation of data that stays as close to the data as possible
6. Services and administration based on the analysis, synthesis, and interpretation of relevant data

While it may be difficult to establish this constellation of characteristics as unique to psychologists, the characteristics do indicate some of the capabilities psychologists can bring to the study of population. Furthermore, it may be stressed that population research and services certainly appear to be in need of such capabilities. The psychologist acquires many of these capabilities, approaches, and attitudes during graduate education, although he may develop them to a greater extent during his later career. Therefore, a graduate program that has the objective of producing psychologists for population work must insure that the student receives the education (core and methods courses, etc.) necessary to make him a psychologist.

At the same time that disciplinary expertise is assured, interested departments, or departments that have interested students, also should aim toward educating for expertise in population. Such a graduate program should be as interdisciplinary as possible.

Given that a psychology department wishes to aid a student in pursuing a doctorate combining both psychological expertise and an adequate background in population, possibilities for population focus vary in terms of the intensity of focus. The examples listed below provide levels on the continuum from a relatively low to a high emphasis on population.

DISSERTATION ON POPULATION PROBLEMS

The approach involving the least change in most programs would be for the student to do his doctoral dissertation on a population problem. The student would have a major special area or areas (e.g., experimental, developmental, social, clinical, or physiological) and would choose his population dissertation in the major area. In addition to the usual psychology core and methods courses, the student could be required to take basic demography, particularly social demography, courses as an outside minor. These courses will give the student an understanding of basic population dynamics and the major social and economic relationships that have made population problems critical and relatively difficult to solve in many areas of the world. The basic courses are essential to familiarize the student with the concepts and measures commonly employed in describing population phenomena. They would include such topics as relationships among age distributions, fertility, and mortality; the interaction of changes in the timing of births and completed family size; the relative contributions of natural increase and migration to the geographic distribution of population; the relationship of changing age distributions to employment opportunities; and the relationship of population growth to economic development. Although all these topics are outside the normal courses to which a psychologist is exposed, they contain knowledge that is essential to an adequate understanding of population phenomena, to an appreciation of significant population problems, and to the design of research projects that will yield relevant findings. The remainder of the student's work would be similar to that of other psychology graduate students with his fields of specialization, except that the student should be able to take more population work in accordance with his choices and the available time. With such preparation, the dissertation could combine the special area and population foci of the student.

DISSERTATION AND SPECIALIZATION IN POPULATION

Some psychology departments may decide to give population more emphasis. In such cases, in addition to a dissertation on a population psychology topic, the student could substitute population for one of the required psychological areas of specialization. Thus, the amount of time, effort, and course work required for a specialization area could be devoted to population studies. Depending on the courses and resources available, the student could select from graduate courses on population given by sociologists, economists, anthropologists, and others. Such an approach requires some flexibility from those who establish requirements for graduate students in psychology. It also requires commitment to the development of content courses focusing on population but incorporating relevant basic psychological theories and methods. This commitment is necessary because the student who chooses such a graduate program should be assured the means of developing competence in psychology equivalent to students with other psychology foci. With such a background in population, greater career opportunities as a psychologist and broader possible research activities would become available to the graduate of such a program.

INTERDISCIPLINARY EDUCATION WITH PSYCHOLOGY BASE

The development of an interdisciplinary population graduate education program operating from the psychology department requires more innovative and flexible thinking than either of the foregoing kinds of doctoral education. To consider such a program, a psychology department needs to recognize the value of preparing some psychologists to be as expert as possible in both psychology and population, so that they can make their greatest possible contribution to psychological research, education, and services in the population field. It is necessary, also, to act on the assumption that graduate students in psychology can become good psychologists without taking as many psychology courses as were formerly required.

In the interdisciplinary education program, the graduate student would be expected to take the psychology and demography core and methods courses, and to specialize in one or two areas of psychology. Beyond this, with the aid of an adviser, the graduate student would tailor his doctoral program to meet his objectives of developing the capability to work on the psychosocial aspects of population research, training, and services. The student would carefully choose relevant course, clinical, field, and laboratory work in such disciplines as psychology, sociology, economics, anthropology, political science, statistics, city planning, reproductive biology, maternal and child health, and obstetrics and gynecology. The student would be encouraged to obtain more training in some methodological areas other than psychology graduate students usually receive, such as appropriate field experience, survey methodology, and sampling. Field placement could well be in overseas as well as domestic organizations.

It may be recognized readily that such an interdisciplinary program would give the student an enriched scientific and intellectual background while merging laboratory, field, and clinical approaches to produce fresh outlooks, understandings, and approaches. Psychologists are slowly but gradually turning to the study of significant social, political, and economic problems. This interdisciplinary approach furnishes a genuine basis for studying such problems while focusing on population, a highly important and enduring national and international problem with diverse (psychological, social, political, economic, medical, public health, legal, and other) facets and implications.

Graduates of an interdisciplinary program would be able to function well in a psychology department. They could teach their share of the traditional psychology courses, but have the added advantage of being able to teach ordinary, reading, or tutorial courses and direct theses on the psychosocial aspects of population and other important social issues. Such psychologists also could teach interested population students from other behavioral-social science disciplines, as members of the psychology department, as members of another behavioral-social science department, or as members of a population research and training center or program. Such psychologists could also be expected to make major psychological research contributions to the population field. If their interests develop in the population services or administrative areas, they would be well equipped to engage in such activities.

GENERAL SUPPORT AND RESOURCES

STUDENT INTEREST

Plans for developing educational programs at both the undergraduate and graduate levels should take student interest into account as much as is considered feasible and possible. Student interest can be a source of support, not only in fulfilling requirements that courses or educational activities must have a stipulated number of students, but also to inform administrators and professors that students feel the need for and want to take certain courses or related work.

There seems to be a growing interest in population phenomena among psychology and other behavioral-social science students. Reproductive behavior, contraception, out-of-wedlock pregnancies, motivations for parenthood, population growth and decline, and urban concentrations of population are some of the population problems that deeply affect students and greatly stir their interests. It may well be that some students may play a useful role in educating faculty members, particularly if psychology students (undergraduate and graduate) get into other behavioral-social science courses, such as sociology or public health, work in family-planning clinics or field installations, and bring back the broadening effects (as in seminar papers or theses) of these experiences to psychology. Through this input, faculty members and other students might become stimulated to branch out on their own into population and other areas in which they previously may not have been involved.

FACULTY INTEREST

Proceeding from students to faculty, it is clear that a psychology department entering the population area would need at least one faculty member who is interested in and informed about population and who wishes to expand work in this field. For any sizable amount of population work, more such faculty members would be needed. Also, faculty members giving the various psychology courses would have to be interested enough to determine how they could make population topics integral parts of such courses.

Beyond these essential considerations, it would be necessary for other departmental members, and perhaps especially the department chairman, to show a willingness to recognize that an emphasis on population is a normal productive professional path for psychologists to follow. Further, it would be necessary to accept the point that working on population within the framework of a professional interest is a perfectly legitimate scientific pursuit for a psychologist and also that this is legitimate within the various subdisciplines or specializations of psychology.

INSTRUCTIONAL MATERIALS

It is probable that there is actually adequate material on population that has psychological relevance for use for instructional purposes. Also, useful and provocative reading lists can be developed within most psychological subdisciplines. It is likely, however, that there is need for good resource textbooks oriented toward instruction. These may be forthcoming within the next few years.

It has been suggested that the APA or other appropriate organizations explore mechanisms for a "curriculum bank," which, if realized, could make available a number of resources. For example, topic and areal bibliographies (perhaps annotated), course outlines, and curriculum formats might be made available. Along with an information bank, a file might be kept of courses being taught and programs in existence; from such a listing interested persons might more easily pursue a specific interest or program area. Perhaps, from such a listing, interested departments could seek consultants and workshop participants.

It should be stressed that a curriculum bank and a course-curriculum file do not exist at present. Some centers and departments no doubt do have bibliographies available; the existence of these would have to be explored by interested individuals or departments. It is also possible that some centers have affiliated faculty who might be available for consultation; again, this possibility would have to be explored. It is probable that bibliographies can be generated by various bibliographic services. Also, the abstracts in other disciplines, as well as in psychology, do include many population topics. The *Population Index*[c] specializes in bibliographies and abstracts of the population literature. The APA increasingly has indexed issues of concern to the psychologist interested in population and will no doubt continue to do so. Psychologists should make their concern for topics to be indexed known to the APA.

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[c] The *Population Index* is published by the Office of Population Research, Princeton University, Richard Hankinson, editor.

UNIVERSITY RESOURCES AND ADMINISTRATION

It is probable that psychology departments in universities that have population research and training centers or faculty members who are in the population field in other departments (such as sociology, economics, and anthropology) will have greater opportunities to develop in the population area. Such psychology departments could use available resources for training their students or could become integral parts of interdisciplinary education programs. This suggestion certainly does not preclude departments of psychology less advantageously situated from entering population psychology. Indeed, these departments might serve as focal points for stimulating such work in the college or university where they happen to be.

The department of psychology that is developing population work does need a university administration with great sympathy for innovation and the introduction of nontraditional courses. Such a department could also benefit from tolerance and support from other departments in the university (which may be, mainly, sociology, economics, anthropology, and the school of public health) that are concerned with population.

COMMUNITY RESOURCES

It is desirable, in teaching population psychology, to work in communities; this requires connections and resources in the community. Necessary to population study are such resources as total communities that can be surveyed or family-planning clinics in which research may be done. Community experience might include brief interactions or more extensive practicum experience with administrators of family-planning clinics and educational or city-planning groups.

CONCLUSION

This workshop report has incorporated ideas and suggestions for teaching, curriculum development, and other educational activities involving laboratory, field, and clinical approaches in the area of population psychology. It is hoped that such ideas will stimulate an increased focus on population by psychology departments currently interested in and ready for such emphasis, and that these ideas might also stimulate a population focus where none now exists. Population does have a need and a place for psychologists; psychologists must respond to this need. In responding, psychology can only benefit by broadening its scope and its application to the needs of society, and by assuring new, diverse career opportunities for present and future students.

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